ALTA GEOSCIENCES, Inc.
Environmental & Geotechnical Solutions

CLEAN CLOSURE AND SITE CLEANUP PLAN FORMER KINCAID PARK BIATHLON RANGE SITE

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Prepared for:

KINCAID PROJECT GROUP, INC.
LAND DESIGN NORTH, INC.
MUNICIPALITY OF ANCHORAGE
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March 2011

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ALTA GEOSCIENCES, Inc.

Environmental & Geotechnical Solutions

March 21, 2010

Jan Palumbo (AWT-121)
U.S. EPA Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Re: **Former Kincaid Park Biathlon Range Closure Plan**
Anchorage, Alaska

Dear Ms. Palumbo:

Enclosed is the revised Closure Plan for the former Kincaid Park Biathlon Range. This document is submitted on behalf of (listed alphabetically) Kincaid Project Group, Inc., Land Design North, Inc., the Municipality Of Anchorage, and Roger Hickel Contracting, Inc. This document is submitted in accordance with the Consent Agreement and Final Order (CAFO) between these parties and the U.S. Environmental Protection Agency dated October 6, 2010.

If you have any questions, please feel free to contact me at your earliest convenience.

Sincerely,
ALTA Geosciences, Inc.

Alex Tula, L.G.
Principal Consultant

Attachment: Former Kincaid Park Biathlon Range Closure Plan

Cc: Ms. Eileen Olson, Alaska Dept. Environmental Conservation
Ms. Kristi Holta; Kincaid Project Group
Mr. Dwayne Adams; Land Design North
Mr. John Rodda; Municipality of Anchorage
Mr. Mike Shaw; Roger Hickel Contracting, Inc.

FORMER KINCAID PARK BIATHLON RANGE SITE

Photo date 9/27/2008

This aerial photograph shows the soccer stadium under construction

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ACRONYMS & ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AOC	Area of Contamination
CAFO	Consent Agreement and Final Order
CFR	Code of Federal Regulations
COC	Compound of Concern
CY	Cubic yard
DQO	data quality objective
USEPA	United States Environmental Protection Agency
Mg/kg	milligrams per kilogram
OSWER	Office of Solid Waste and Emergency Response
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
SOP	Standard Operating Procedure
TCLP	Toxicity Characteristic Leaching Procedure

1.0 INTRODUCTION

This *Clean Closure and Site Cleanup Plan* (hereafter referred to as "Closure Plan") describes the means and methods to reach "Clean Closure" of the former Kincaid Park Biathlon Range Site (the Site) in Anchorage, Alaska. This Closure Plan is intended to fulfill the requirements as set forth by the Resource Conservation and Recovery Act (RCRA) as codified in Chapter 40 Code of Federal Regulations (CFR) Section 265.112 (40 CFR §265.112) and as described in OSWER (Office of Solid Waste and Emergency Response) Directive 9476.00-5 *RCRA Guidance Manual For Subpart G Closure And Post-Closure Care Standards And Subpart H Cost Estimating Requirements* (U. S. Environmental Protection Agency (USEPA), January 1987).

Although USEPA is the lead agency for this action, this Closure Plan is intended to meet the joint requirements of the USEPA and the Alaska Department of Environmental Conservation (ADEC). "Clean Closure" as used herein is defined by USEPA to mean the removal of all hazardous wastes (as defined in federal regulations) and remediation of all other contaminants of concern to appropriate risk based requirements. For the purposes of this Closure Plan, the risk based requirements conform to ADEC cleanup levels promulgated in state regulations.

This Closure Plan has been prepared by ALTA Geosciences, Inc., on behalf of (listed alphabetically) Kincaid Project Group, Inc., Land Design North, Inc., the Municipality of Anchorage, and Roger Hickel Contracting, Inc. This Closure Plan is submitted in accordance with the requirements of the Consent Agreement and Final Order between (CAFO) these parties and the U.S. Environmental Protection Agency dated October 6, 2010. A copy of the CAFO is contained in Appendix A.

The Site, which includes the former biathlon range and surrounding areas which have been disturbed by construction activities at various times, is in the process of being redeveloped from its former use as a biathlon shooting range for 22 caliber rifles to a public soccer stadium. This redevelopment is being undertaken by Kincaid Project Group (KPG), a non-profit corporation. KPG is implementing various recreational projects within Kincaid Park funded jointly by federal, state, municipal, corporate and private sources. Kincaid Park is wholly owned by the Municipality of Anchorage. Earthwork activities have resulted in unintentional spreading of soil potentially impacted by Lead and Antimony from rifle bullets throughout portions of the site.

The process of achieving site closure has been complicated by numerous uncertainties and data gaps relevant to site cleanup design, including uncertainties as to the total mass of ammunition used through the years of its operation, the scope and sequence of the prior earthwork, the nature and volume of remaining potentially impacted media, and the location of excavated soil in the fill areas. One of the primary challenges is how to identify and remove potentially contaminated media from the fill when the contamination distribution and volume is unknown and likely small relative to the much larger fill volume.

The approach presented herein is a stringent characterization-based option; specifically, near-complete removal of discrete fill areas for field screening, segregation, and treatment and disposal as warranted. This process is a hybrid of site characterization and concurrent segregation, onsite or offsite treatment, and offsite disposal. The basic field elements are a visual survey to identify and remove projectile fragments on the site surface, excavation of the fill areas for visual and field screening, a soil removal action at the remaining portion of the former target line bench (approximately the southern third), and segregation and stockpiling soil based on potential contamination characteristics. This closure approach has five general components – excavation, characterization, segregation, treatment and disposal. The site characterization component is designed to obtain sufficient data to assess the potential presence/absence, location, distribution, and composition of projectile fragments and/or impacted soil at the project site. Contaminated media identified through the characterization process will be segregated in on-site soil storage areas, pending treatment which may be required, and offsite disposal in an appropriate landfill.

Any changes to this plan must be agreed to in writing by the agencies.

1.1 FACILITY CONTACT INFORMATION

The principal point of contact for all communications with USEPA and ADEC regarding this Closure Plan will be:

- Mr. John Rodda
  Municipality of Anchorage
  Department of Parks & Recreation
  PO Box 196650
  Anchorage, AK 99519-6650
  Tel: (907) 343-4562
  Email: RoddaJH@ci.anchorage.ak.us

Other facility contacts (listed alphabetically) are:

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  Fax: (907) 279-1405
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Principal points of contact for the regulatory agencies are:

U.S. Environmental Protection Agency:

Ms. Jan Palumbo
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1.2 PROJECT MANAGEMENT AND ORGANIZATION

This section identifies the entities that will be involved with the Plan implementation, along with their roles and responsibilities, and outlines the procedure for communicating with the agencies throughout the project.

1.2.1 Project Coordinator

A Project Coordinator will be appointed to facilitate implementation of this Closure Plan. The Project Coordinator will have the following responsibilities:

- Ensure all appropriate permits (e.g. MOA fill-and-grading permit, etc.) are acquired, current, posted, and implemented
- Prepare a storm water pollution prevention plan (SWPPP), if deemed necessary for the site
- Notify EPA and ADEC of the project field schedule at least 48 hours prior to initial site work;
- Coordinate the activities of the Environmental Consultant, Earthwork Contractor, and other on-site contractors;
- Monitor excavation, stockpiling, backfilling operations, field screening, and soil sampling and analysis for compliance with this Plan; site development needs (e.g. soil quality and compaction requirements for future soccer field); permit requirements; and SWPPP requirements;
- Maintain a record of all persons entering and exiting the project site other than representatives of the Environmental Consultant and Earthwork Contractor;
- Verify that all site access controls, including fences and gates, are maintained;
- Facilitate coordination between stakeholders, contractors, and/or agencies, as needed, in responding to unexpected conditions and/or variances from this Plan,
- Notifying the project team and agencies of site circumstances that may affect the project scope, schedule, or budget;
- Collect and retain daily reports submitted by the Environmental Consultant and/or Earthwork Contractor;
- Provide input to earthwork contractor in establishing site control zones (exclusion zone, contaminant reduction zone, and support zone), as appropriate, and in planning tailgate meetings; and
- Prepare a written weekly report and notify agencies of changes to the weekly schedule

1.2.2 Environmental Consultant

The Environmental Consultant will implement the environmental assessment tasks in the Cleanup Plan. Key responsibilities of the Environmental Consultant include:

- Monitoring construction of the soil storage area; conducting the visual survey of the site surface;
- Collecting field screening readings and analytical soil samples in conformance with 18 AAC 75.355 *Sampling and Analysis*;
- Directing segregation of soil in accordance with the criteria described in the Cleanup Plan;

- Monitoring stockpile soil placement;
- Documenting site characterization activities;
- Preparing daily reports.

The Environmental Consultant will provide a field team comprising a team leader with at least 5 years experience managing environmental assessment projects who will be a “Qualified Person,” as defined by the ADEC in 18 Alaska Administrative Code (AAC) 75, and supporting field staff as necessary to complete the characterization tasks. The name and contact information for the environmental consultant will be provided to EPA and ADEC at least 5 days prior to beginning initial site work. The environmental consultant’s team will include a Registered Professional Engineer who will be familiar with all aspects of the closure activities and who will sign and stamp the certification of clean closure as described in Section 4.3.

1.2.3 Earthwork Contractor

The Earthwork Contractor will implement the soil excavation, movement, and backfilling/compaction tasks. Key responsibilities of the earthwork contractor include, but may not be limited to:

- Provide the equipment and personnel to implement the earthwork needed to implement the site characterization and soil removal actions described in this Plan;
- Establish and maintain site control areas, including an exclusion zone, contaminant reduction zone, and support zone at the locations identified by the Project Coordinator;
- Lead daily tailgate meetings;
- Obtain materials needed to construct the soil storage area(s);
- Construct the soil storage area(s);
- Transport segregated soil to dedicated soil storage areas identified by the environmental consultant;
- Replace soil that is field-screened as clean back in the excavation and conduct compaction as needed;
- Transport non-RCRA wastes to the Anchorage Regional Landfill; and
- Conduct site restoration earthwork.

The name of the Earthwork Contractor will be provided to the agencies at least 5 days prior to the start of field activities.

1.2.4 Subcontractors

Other tasks that are anticipated to be subcontracted include professional surveying, analytical laboratory services, onsite treatment services, and transportation, offsite treatment, and disposal services. All laboratory analyses will be performed by a laboratory certified by ADEC.

1.3 COMMUNICATIONS PLAN

The Environmental Consultant will prepare daily reports that summarize work completed, personnel and equipment used, and number of field screening and analytical soil samples collected. The daily reports will be submitted to the Project Coordinator for consolidation and retention.

The Project Coordinator will prepare a weekly report that summarizes the work performed during the preceding week, work planned for the following week, unexpected discoveries or unforeseen occurrences affecting the work, results of field screening and laboratory testing; and events or occurrences which may impact the schedule or the successful completion of the work. The plan for the following week's work will include the work that will be performed, the specific location(s) where work will be conducted, and what type of screening and/or sampling will be performed. The weekly report will be distributed by email to the project team and agencies by noon each Friday until the field work is completed. Changes to the weekly schedules during implementation will be communicated to ADEC within 24 hours of knowledge of circumstances that necessitate such changes. Copies of all field notes from the preceding week will be provided to the agencies on a weekly basis.

EPA and ADEC will be notified of the intended disposal facilities at least 5 days prior to the start of onsite construction activities.

At the conclusion of all closure activities, a construction completion summary report documenting the results of the visual survey, projectile removal efforts, and all site characterization and cleanup activities will be submitted. The report will be presented in standard narrative technical report form. The report will be submitted to USEPA and ADEC. The key report elements are listed below:

- Description of field procedures;
- Summarized field data, including tabulated field screening and analytical results, and photographs;
- Site plans and maps depicting test pit and soil sample locations;
- A description of any deviations from the approved closure plan and justification for these deviations.

- All laboratory and/or field data, including sampling procedures, sampling locations, quality assurance/quality control samples, and chain of custody procedures for all samples and measurements, including samples and measurements taken to determine background conditions and/or determine or confirm clean closure, and conformance with the requirements of 18 AAC 75.355 *Sampling and Analysis*;
- Survey data;
- Copies of all analytical laboratory certificates including completed ADEC Laboratory Data Review Checklist for each data package;
- Description of on-site soil treatment activities;
- Summary of offsite soil disposal and offsite soil treatment, if applicable;
- Conclusions regarding the status of the site cleanup effort;
- Copies of field notes;
- Copies of all waste disposal manifests and certificates
- Documentation of the final disposition of all hazardous wastes and hazardous waste residues, including contaminated media, debris, and all treatment residuals.
- A description of what the area looks like at completion of closure, including a description of what parts of the former site, if any, will remain after closure.

1.4 PRODUCTS AND PRODUCTION PROCESSES

1.5 SITE AREA DEFINITIONS

The following discrete areas are all portions of the overall site subject to this Closure Plan:

Project Site. The project site is defined as that portion of Kincaid Park that is being redeveloped as a soccer stadium, and is generally bounded by the area of control and operations for the construction effort. The following individual components are included:

- **Former Biathlon Range**. The former biathlon range consisted of several components:
    - **Firing Line.** This is the area where shooters would stand, kneel, or lie while firing. Lead may have been deposited here as a result of spilling of unexpended rounds or clearing of misfires.
    - **Range Floor/Shot Fall Area.** This is the area between the firing line and the target line bench. Lead may have been deposited in this area as a result of short shots or bad aiming. Some “backsplash” of pulverized projectiles may be expected on the range floor closest to the target line bench.

- **Target Line Bench.** This is the raised soil berm that contains the target line. The target line bench had a typical width of about 11 feet and variable thickness up to several feet, depending on the underlying surface grade. The majority of residual spent ammunition and potentially impacted soil is typically located on and in the target line bench and backstop (see below).
- **Target Line.** The target line refers to the line on the target line bench where the targets were placed. Available data suggests that the area where the target line was located had a length of approximately 220 feet.
- **Backstop**. The area comprises the soil behind the target line. The backstop berm at this site was approximately 7 feet high.

- **Cut and Fill Areas.** The cut and fill areas comprise those areas where soils have been excavated and/or placed during modification to the biathlon range and more recently in its conversion to a soccer stadium.
  - **Cut A**. Cut A encompassed the Firing Line and Range Floor and adjoining areas to the west and north. This cut also included portions of the northern two-thirds of the Target Line following removal of the surficial Lead containing soils. This area was excavated several feet. The excavated soil which may contain bullets and fragments was placed in the area identified as Fill A1.
  - **Fill A1.** This area contains soils excavated from Cut A and may contain bullets and bullet fragments. This material was reportedly placed in May and June 2008.
  - **Fill A2.** This area contains soil that was removed from Cut A to extend and contour the pre-existing berm south of the former biathlon range. It is possible, though less likely, that this soil also contains bullets and bullet fragments. It was placed in June 2008.
  - **Fill A3.** This area may contain impacted soils but the history of this area is unclear.

Area of Contamination (AOC). The AOC policy was developed by the EPA to provide flexibility in managing impacted media within known contaminated areas. As it applies to this project, potential Lead-impacted soil that is removed from the fill can be consolidated within the AOC without triggering a new point of generation or Land Disposal Restrictions. Impacted and/or potentially impacted soil will be consolidated (stockpiled) on site, within the established AOC, in a manner that is consistent with ADEC requirements for long-term storage, but does not meet the narrower container restrictions and treatment timelines in 40 CFR 262.34 typically required for non-permitted waste accumulation and on-site treatment by generator.

In establishing the specific AOC boundaries at the site, the EPA stated "The contiguous soccer field project area is considered a landfill unit for the purposes of RCRA, and is a single area of contamination (AOC) for the purposes of applying the AOC concept (or policy)" (Email from J. Palumbo dated 8/31/10). The proposed AOC for the project site is shown on Figure 2.

All of the areas described above are subject to closure under this Closure Plan. In all cases, these consist solely of soil contaminated with Lead and Antimony resulting from bullets, bullet fragments, dust, and leaching products. No other components are known to be present. Hazardous wastes present are exclusively D008 – Lead characteristic waste, although only a small percentage of the soils are expected to fail the TCLP criteria for Lead.

The mass of Lead comprising the initial inventory (fired at the range) and the remaining inventory (after removal of 78.1 tons of soil and Lead) cannot be conclusively determined. Therefore, there is no reasonable basis to establish a target mass of Lead that may be identified during implementation of the closure.

2.0 FACILITY INFORMATION

2.1 SITE DESCRIPTION

The project site is located near the west end of Raspberry Road, in the northwest ¼ of the northeast ¼ of Section 7, Township 12 North, Range 4 West, Seward Meridian, Alaska. The project site is owned by the Municipality of Anchorage (MOA), and is in the process of being redeveloped by the Kincaid Project Group (KPG). KPG is a non-profit organization that raises funds to implement recreational improvements within Kincaid Park (e.g. soccer fields and snowmaking equipment). A vicinity map showing the site and surrounding area is included as Figure 1.

A portion of the overall site was used as a biathlon shooting range beginning in 1988 and continuing until shortly before the beginning of construction of the soccer stadium. The use as a biathlon range resulted in many 22 caliber (0.22 inch diameter) Lead bullets being fired at targets on the target line. Bullets striking the targets could flatten or shatter with the resulting Lead fragments landing on the ground near the targets, while bullets missing the targets could be imbedded in the soil berm behind the target line. In addition, some bullets may have landed between the firing line and the target line due to short charges or misfires. Lead bullets are not considered a hazardous waste subject to RCRA by EPA at the time they are discharged from a firearm because they are used for their intended purpose. Subsequently, however, they became solid waste, and potentially hazardous waste, subject to regulation.

Although bullets are comprised principally of Lead, other metallic compounds may be present. As discussed Section 2.3, compounds of concern (COCs) at the Site include both elemental Lead and Antimony.

Products containing Lead can potentially result in the generation of characteristic hazardous wastes as defined under 40 CFR §261 when discarded or disposed of. Soils containing Lead can result in waste code D008 hazardous waste if the concentration in the Toxicity Characteristic Leaching Procedure (TCLP) test exceeds 5.0 mg/L. Although Antimony is considered a COC for the site, elemental Antimony is not a characteristic hazardous waste under 40 CFR §261.

In 2008, on-site work was initiated to redevelop the former biathlon firing range as a soccer stadium, including an artificial playing surface and concrete seating. Earthwork commenced in May 2008, and continued through September 2008. A total of 78.1 tons of Lead-impacted soil was transported off site on September 24 and 26, 2008. This material was placed into roll-off boxes, manifested as a hazardous waste, and transported to a permitted Subtitle C facility.

2.2 SUMMARY OF ENVIRONMENTAL ASSESSMENTS

This section is an overview of the environmental and geotechnical sampling conducted since April 2008.

2.2.1 2008 Characterization and Confirmation Soil Sampling

Soil samples were collected on multiple occasions from 2008 through 2010 to characterize the excavated soils along the former target line, confirm remaining concentrations in the soil following the 2008 excavations, characterize transported sediment, assess the soils' physical properties, and evaluate the potential presence of shallow groundwater. Initial characterization samples collected from the target line bench in April 2008, before the May/June 2008 earthwork, confirmed the presence of projectile fragments and Lead concentrations greater than ADEC and EPA/RCRA regulatory standards.

Elevated levels were also measured in the soils that were removed from the north end of the former target line bench, stockpiled on site, and eventually transported off site for disposal as regulated hazardous waste; and in composite samples from near-surface soils at the south end of the former target line bench. Subsequent confirmation samples collected from soils beneath the northern two-thirds of the former target line bench verified Lead concentrations less than cleanup levels, although the depth of these samples has not been conclusively established.

2.2.2 2009 Environmental & Geotechnical Soil Sampling

Site assessment activities conducted in 2009 included testing sediment from erosion runoff and soil samples to measure physical soil properties. On May 18, 2009, a Shannon & Wilson representative collected soil samples from the area where transported sediment accumulated between initial and supplemental silt fences. The ten project samples and one duplicate sample contained total Lead concentrations between 2.85 and 5.78 milligrams per kilogram (mg/kg). Antimony was not detected in the soil samples. These Lead concentrations are consistent with background levels, and less than the applicable cleanup levels. Shannon & Wilson collected soil samples in August 2009 to measure physical properties of the fill soils. Samples were collected from eight spatially representative locations along the fill slopes of Fill A1 and A2 areas. The eight samples were tested for fine particle content (silt and clay) by washing over a #200 (0.075 millimeter) sieve by ASTM International (ASTM) Method D1140. Based on the fine particle contents, two samples were selected for full particle size distribution analysis by ASTM Method D422, and two samples were selected for grain size (sieve) analysis by ASTM Method C136. Results of the particle size analyses suggest that the fill consists primarily of silty fine sand. The fine particle (smaller than the #200 sieve) contents in the eight samples range from 5.9 to 60 percent.

Estimates of hydraulic conductivity (referenced as permeability in EPA guidance documents) were obtained using the grain size distributions, and results of falling-head percolation tests conducted at the locations of Samples S-2 and S-5. The percolation tests indicate hydraulic conductivities on the order of 10^{-2} to 10^{-3} centimeters per second (cm/sec). In comparison, conductivities estimated from grain size distribution ($k=aD_{10}2$) are on the order of 10-3 to 10-4 cm/sec. The latter tests likely represent uniform (homogenized) soils in laboratory molds, whereas the field percolation test soils include soil structures such as natural voids, worm and insect channels, layering, and a variety of soil structures that may increase fluid transport during the tests.

2.2.3 2010 Soil Boring

Assessment work conducted through July 2010 included one soil boring to assess potential groundwater aquifer formations, and a screening/sampling effort to correlate the x-ray fluorescence (XRF) with analytical data.

Shannon & Wilson advanced one soil boring to 70 feet bgs near the southeastern corner of the Kincaid Park soccer stadium on March 17, 2010 using direct-push technology. Soil samples were collected from five depths for analysis of total Lead and total Antimony. Measured Lead concentrations were less than the cleanup levels, with a maximum result of 27.3 mg/kg. Antimony was not detected in the analytical samples. Additional details of the 2010 soil boring effort are provided in Shannon & Wilson's March 29, 2010 letter report, *Shallow Groundwater Determination, Former Kincaid Biathlon Range, Anchorage, Alaska*.

2.3 COMPOUNDS OF CONCERN

The contaminants of concern (COC) for the project site were established by researching metals that are typically found at shooting ranges, and biathlon ranges in particular, and modifying the findings with site-specific data. Based on these findings, Lead and Antimony (common constituents of bullets) are considered COCs at this site.

2.4 SITE ASSESSMENT AREAS

The locations where soil was excavated, placed, or spread during cut and fill operations during the soccer stadium development have been divided into site assessment areas for characterization purposes. In general, the areas are differentiated by the potential to contain either projectile fragments and/or Lead concentrations in soil. The site assessment areas are depicted on Figure 2.

3.0 CLOSURE PERFORMANCE STANDARD

The Site including all areas described above will be closed in a manner that complies with the requirements of 40 CFR §265.111 and achieves "clean closure." The objectives of the closure activities at the Site are as follows:

1. Minimize the need for further maintenance and regulatory oversight.
2. Control, minimize or eliminate, to the extent necessary to protect human health and the environments, the post-closure escape of hazardous waste, hazardous constituents, contaminated run-off, or hazardous waste decomposition products to the ground, surface water, ground water, or to the atmosphere.
3. Remove waste and waste residues and properly dispose of them off site.
4. Perform soil sampling and analyses to ensure soils at the Site meet the cleanup levels discussed below for unrestricted site use, and remove any soils contaminated above these levels.
5. Return the land to productive use for the planned land use as a soccer stadium to be open to the public and for any other use consistent with the recreational purpose of Kincaid Park.

For the purposes of this Closure Plan the cleanup objectives proposed for the site include:

1. Segregation, removal, treatment, and disposal of bullets and bullet fragments to the extent practical
2. Removal, treatment and disposal of all soils which are characterized as D008 hazardous waste due to the Lead characteristic.
3. Removal of all soils containing greater than 400 mg/kg total Lead which are not otherwise characterized as hazardous waste due to the Lead characteristic with appropriate disposal.
4. Removal of all soils identified or characterized as containing Antimony in excess of ADEC cleanup standards with appropriate offsite disposal.

The selection of 400 mg/kg total Lead is based on the following:

1. The most restrictive cleanup level provided for unrestricted site use under 18 AAC 75.341.
2. Current EPA guidance on soil cleanup levels for play areas at residential sites (e.g., 40 CFR §765.65).

3.1 CLEANUP LEVELS

The cleanup levels for the site are shown on Table 1. The ADEC standards are the Method 2 cleanup levels for the "under 40 inches" precipitation zone (18 AAC 75.341, October 2008), and the EPA standards are the toxicity characteristic standards (Table 1, 40 CFR 261.30).

4.0 CLOSURE ACTIVITIES

This section describes the activities that will be performed to achieve clean closure.

4.1 DECONTAMINATION

For this Site closure, decontamination will apply only to personnel and equipment used in the excavation, management, treatment and disposal of soils and Lead debris. Decontamination residuals will be placed in drums, characterized, and disposed of in accordance with state and federal regulations.

4.2 TREATMENT AND DISPOSAL OF HAZARDOUS WASTE AND CONTAMINATED MEDIA

Treatment and disposal of hazardous waste, contaminated media, and nonregulated waste generated during this closure process are described in Section 5.

4.3 CERTIFICATION OF CLEAN CLOSURE

Within 90 days of completion of the closure activities described in this Closure Plan, the Site property owner will submit to USEPA, by registered mail, certification that the site has been closed in accordance with this closure plan. The certification will be signed by the designated representative of the Site owner who will make the following certification:

> *I certify under penalty of the law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing of violations*

The closure certification also will be signed and stamped by the independent qualified registered professional engineer identified in Section 1.2.2 above.

A "survey plat" of the Site following will be prepared after completion of all closure activities and signed and stamped by a professional land surveyor registered in the State of Alaska. This will be submitted as part of the construction completion summary report described in Section 1.3.

4.4 CONDITIONS THAT WILL BE ACHIEVED WHEN CLOSURE IS COMPLETE

When closure is complete, all hazardous wastes and all soils identified or characterized as exceeding the site cleanup levels will have been removed and properly disposed of offsite. This will result in “Clean Closure” as defined by USEPA and “Cleanup Complete” as defined by ADEC.

4.5 HEALTH AND SAFETY CONSIDERATIONS

The project site is known to be impacted by Lead and Antimony. Appropriate health and safety measures need to be taken by all site workers, project team and agency representatives, and visitors. The site security fencing will be updated prior to the beginning of any earthwork such that the fencing extends along the sides of and above or in front of the concrete stadium and other areas as necessary to secure the site.

Each entity that conducts work at the project site is fully responsible for evaluating health and safety risks, and for providing appropriate training and personal protection equipment (PPE) for its own employees.

The Environmental Consultant will prepare a site-specific Health and Safety Plan (HASP) for its employees. The Environmental Consultant will be responsible for ensuring its HASP conforms to requirements of 29 CFR 1910.120, and verifying its employees meet the training and monitoring requirements of their HASP. The Environmental Consultant will also verify that its subcontractors have a HASP, but will not be responsible for the plan(s) contents or implementation in the field.

The Earthwork Contractor will prepare a site-specific Health and Safety Plan (HASP) for its employees and subcontractors. The Earthwork Contractor will be responsible for ensuring its HASP conforms to requirements of 29 CFR 1910.120, and for verifying its employees meet the training and monitoring requirements of their HASP. The Earthwork Contractor will also be responsible for maintaining site control zones (exclusion zone, contaminant reduction zone, and support zone), as appropriate and identified by the Project Coordinator.

The Project Coordinator will prepare a site-specific Health and Safety Plan (HASP) for its employees. The Project Coordinator will be responsible for ensuring its HASP conforms to requirements of 29 CFR 1910.120, and for verifying its employees meet the training and monitoring requirements of their HASP. The Project Coordinator is also tasked with controlling site access by visitors who may not have health and safety training. The Project Coordinator may deny site access to site visitors who do not have such training. If access is denied, the Project Coordinator will establish an area outside the exclusion zone (e.g. in or above stadium seating) where authorized visitors may view the project site. Alternatively, the Project Coordinator may write its HASP to include site visitors. For visitors who do not meet the training and monitoring requirements of the HASP, the Project Coordinator may, at its discretion, conduct a brief orientation, provide personal protection equipment, and escort visitors while on site.

Copies of all HASP documents will be kept at the Project Coordinator’s on-site field office. However, the Project Coordinator will not be responsible for approving the HASP contents, or for verifying compliance by any entity other than its own employee(s). All onsite workers will immediately report any on-site injuries or health and safety concerns to the Project Coordinator, in addition to the notification requirements of their individual firm's HASP.

4.6 SITE CONTROLS / PRE-CONSTRUCTION SURVEY

Site control points will be established prior to the site closure activities. The purpose of the site controls will be to identify the approximate location of the Cut A – Fill A1 interface, and to provide accurately located reference points from which to take future measurements for locating purposes. Site controls will be located at the northeast and southwest corner of the cut-fill interface, the four corners of the soccer stadium, the southeast corner of the former target line excavation area, and the southwest corner of the cleared soccer field area, as shown on Figure 2. A professional land surveyor will locate and mark these points at the project site. The surveyor will also establish the locations of the other control points, and place markers where needed for future reference measurements.

The approximate location of the cut-fill interface as shown on Figure 2 will be marked on the ground using stakes and/or spray paint.

During the subsequent site closure activities, site features (e.g. excavation boundaries, sample locations, etc.) can be located using measurements from the established control points.

4.7 PILOT STUDIES

4.7.1 XRF Correlation Study

A field study was conducted on May 18 and 19, 2010 to assess the correlation between XRF screening readings and analytical data. The purpose of the study was to develop an XRF action level that can be used to segregate excavated soils, and to guide sample selection in the site characterization and/or remedial action efforts.

The samples for the study were collected from the surface soil at the south end of the former target line bench, where elevated Lead concentrations were measured following the September 2008 excavation. Before collecting comparative samples, a Niton XL3t series XRF meter was used to conduct preliminary screening and establish general areas of interest. The general Lead concentration ranges of interest were: non-detect (ND), 25 to 200 mg/kg, 200 to 600 mg/kg, 600 to 1,000 mg/kg, and greater than 1,000 mg/kg. The meter run time for each reading was 30 seconds, although stabilization was generally achieved with 10 to 15 seconds.

A total of 45 screening samples were collected, with locations selected at random within the area of interest. Two screening methods were applied. Both are variations of the "in-situ" testing method described in EPA Method 6200. At each location, screening readings of Lead and Antimony were collected directly from the ground surface by placing the meter window against the soil surface. To assess the method precision and the impact of matrix heterogeneity, additional readings were taken from a homogenized soil portion at each location. A new plastic spoon was used to transfer about 2.5 ounces of soil into a re-sealable plastic bag. Visible projectile fragments, if present, were removed from the sample and noted in the field log. The soil was mixed by hand in the sealed bag to homogenize the sample. Three XRF readings were taken from each bagged soil sample, and the sample was retained for potential laboratory analysis. The sample location was marked with colored flags to demarcate the general Lead concentration ranges based on the readings.

Samples from 30 locations were selected for laboratory analysis. The samples were selected based on field screening readings, to target the specific Lead concentration intervals listed above. Due to variability in screening reading magnitudes, the applicable concentration range for a given sample was determined by agreement of at least two of the three readings taken from the homogenized bagged samples. Two (2) samples were selected from the ND readings, eight (8) samples (including one duplicate) were selected from the 25 to 200 mg/kg range, fifteen (15) samples (including two duplicates) were selected from the 200 to 600 mg/kg range, Four (4) samples were selected from the 600 to 1,000 mg/kg range, and four (4) samples were selected from the greater than 1,000 mg/kg range. Analytical soil samples were prepared by transferring soil from the corresponding plastic bag to the laboratory-supplied 2-ounce glass jar. Soil samples were transported to SGS Environmental Services using chain-of-custody procedures, and tested for Lead and Antimony by EPA Method SW 6020A. Swing-tie measurements were taken from two existing steel rebar and the southwest corner of the stadium bleachers to identify the locations of the samples collected for laboratory testing.

From a qualitative perspective, it is clear there is a positive correlation between the Lead screening and analytical results (i.e. higher screening readings correspond to higher analytical results). In general, the XRF readings are biased low, relative to the analytical results, with increasing low bias as XRF reading values increase. This bias is reflected in the poor statistical correlation, with a slightly better result for the average bag screening reading (R^2=0.48) than for the direct surface measurement. However, several useful conclusions are drawn with respect to future field screening utility, and in particular the occurrence of “false negatives” at given concentrations of interest:

1. Both samples that had non-detects on the XRF (both methods) had analytical Lead concentrations less than 25 mg/kg. This finding is consistent with results from the March 2010 soil boring effort.
2. The four samples with detectable XRF readings less than 100 ppm Lead, using the average bag readings only, contained Lead concentrations within a factor of two of the screening reading, suggesting 100 ppm may be an appropriate action level relative to the 400 mg/kg ADEC Method 2 cleanup level. However, the three detectable readings less than 100 ppm Lead using the direct screening method are not consistent with this correlation.

4.7.2 Metal Detector Sensitivity Study

A metal detector is proposed for use in the visual survey and other field screening activities. Based on preliminary testing, a Garret Ace 150 detector was capable of detecting half of a .22 caliber bullet (approximately 3/16 to 4/16 in diameter) buried up to 8 inches in gravel. A literature review will be performed to evaluate the optimum metal detector for the intended use at the site. The agencies will be notified of the specifications of the selected detector prior to performing the sensitivity study. This sensitivity will be confirmed at the project site prior to use in the visual survey. The sensitivity study results will be provided to ADEC for review and approval prior to use of the instrument for subsequent project tasks. ADEC will be notified 24 hours prior to the initiation of the metal detector sensitivity study described below.

The metal detector sensitivity study will be initiated by locating an area where projectile fragments are visible on the ground surface (possibly along the northwest corner of the fill area, where occasional fragments were observed in the spring of 2009 and/or the south end of the former target line bench). The ability of the instrument to detect these fragments on the ground surface will be tested in both a stationary position and sweeping motion. Next, depth and fragment size sensitivity will be evaluated by planting projectile fragments at various depths in soils that otherwise screen clean using the detector. Typical projectile slugs and flattened disks will be placed 0.5 inch, 1 inch, then at 1-inch intervals to determine the instruments depth sensitivity to these particles. The detector's fragment size sensitivity will be assessed by placing iteratively smaller projectile fragments at a depth of 0.5 inch below the surface of the typical silty sand comprising the site soil.

4.7.3 Field Screening Action Level Assessment

Field screening using the XRF will be used during the fill area assessment to segregate soil based on apparent contaminant concentrations, and to identify clean soil that can be replaced / re-used without additional sampling. Based on the data collected to date, the tentatively planned action levels are listed below.

Clean Soil Action Level. Soil exhibiting a direct XRF reading of either non-detect (ND) with a detection limit less than or equal to 25 ppm Lead, or detected at a concentration less than or equal to 25 ppm Lead will be considered clean and can be immediately used as backfill without any additional sampling or screening.

Potentially-Impacted Soil Action Level. A 50 ppm Lead action level will be used to segregate potentially impacted soil into two general categories. Soil with XRF readings greater than 50 ppm Lead will be considered "Potentially Impacted", whereas XRF readings between 25 and 50 ppm Lead will be indicative of potentially clean soil. The corresponding soil for the two XRF concentration ranges will be stockpiled separately in the soil storage area, and subject to different analytical sampling frequencies.

A field correlation study may be conducted to verify the potentially-impacted soil action level. The scope of a proposed correlation study is outlined below. Results of the correlation study will be provided to the agencies for review and determination if a different field action level is justified and approved.

When the first detectable XRF reading between 25 and 50 ppm Lead is observed in the field, an analytical soil sample will be collected from the corresponding backhoe bucket. The method of soil sample collection will entail removing a 2-ounce portion of soil directly beneath the XRF reading location, homogenizing the sample in a re-sealable plastic bag, taking an additional field screening reading to verify the initial reading, and submitting the sample for chemical testing. The remaining soil from the bucket (approximately 2 CY) will be set aside in the soil storage area pending receipt of analytical results. This sampling approach will be applied to the first ten (10) readings within the target range. This number was determined based on EPA's statistical analysis guidance document, which suggests a sample size of eight or more for an adequate tolerance interval (EPA, 1989). In addition to the project samples, one duplicate will be collected.

The resulting set of screening readings and analytical results will be evaluated using a statistical method consistent with EPA statistical guidance documents. The proposed changes to the action levels, if warranted, along with the supporting data will be proposed to the agencies for approval prior to implementation in the field.

4.7.4 Lead / Antimony Correlation Study

Previous studies suggest that soils containing Antimony in excess of the cleanup level (3.6 mg/kg) also contain Lead far in excess of the Lead cleanup level (400 mg/kg) and that when Antimony is found to exceed site cleanup levels, the Lead concentration typically exceeds the site cleanup level by an order of magnitude or more. Field screening for Antimony is further complicated by the fact that the XRF detection limit for Antimony exceeds the site cleanup level, and the correlation between the field XRF Antimony readings and the laboratory analyses for Antimony was poor. This relationship will be studied further during the excavation of the South Target Line Bench excavations described in Section 4.11. The correlation study will proceed as follows:

- Soils excavated from the South Target Line Bench which are "Screened Clean" based on observations for Lead will be placed in temporary stockpiles separate from but similarly constructed to those for soils screened as "Potentially Clean" (see Section 4.9).
- One soil sample will be collected for each 50 CY of such soils and analyzed in the laboratory for Lead and Antimony.
- All confirmation samples from the floor of the final excavation will be laboratory analyzed for both Lead and Antimony.

All samples will be analyzed on a “rush” basis. The results will be reviewed, summarized, and submitted to the agencies for an expedited review. Based on the review of the data, one of the following conclusions is anticipated:

1. The previously observed correlation appears to be valid. In the future, soils screened “Clean” for Lead will be considered as meeting the cleanup criteria for Antimony also.
2. The correlation is less compelling, in which case soils screened “Clean” for Lead will need to be temporarily stockpiled as for soils screened “Potentially Clean” and analyzed for both Lead and Antimony on the basis of one sample for each 50 to 200 CY of soils. The final ratio will depend on the consistency of the results.

4.8 SURFACE SURVEY AND PROJECTILE FRAGMENT REMOVAL

This task serves to verify that the cut areas are generally free of visible or detectable projectile fragments, and to manually remove projectile fragments from the site surface across the AOC. The survey will be conducted using a two-step process – a surface sweep to identify locations of projectile slugs and fragments, followed by a targeted removal effort.

4.8.1 Surface Preparation

The imported gravel and sand bags used to secure the 20-mil liner presently covering part of the proposed soccer field will be removed and placed in an area outside Fill Area A1 and other areas of contamination. If the berm material spills onto the Fill A areas and/or the south target line during removal, the gravel will be carefully removed so that potential projectile fragments and impacted soil are not also removed. Previously spilled gravel will be treated in the same way. The liner will then be removed to allow for investigation and cleanup. The stockpiled berm material and 20-mil liner sections may be used to construct the soil storage area, as described in Section 4.10.

Grass and other vegetation will be mowed from all surface assessment areas prior to beginning the surface assessment work. Cuttings will be bagged and disposed of at the municipal landfill.

4.8.2 Transect Survey

The surface survey will be conducted along linear transect lines. To achieve comprehensive surface coverage, the transect lines will be spaced at 5-foot intervals. The proposed transect plan is shown in Figure 6. Transect lines will be established in the field using survey methods. The site will be walked by a two-person field team along transect lines. One field technician will walk each transect line using a metal detector sweep so that the entire area is covered. The second technician will scrutinize the ground surface for visible fragments and evaluate any hits from the metal detector. For planning purposes, we assume the transect survey will begin in the southwest corner of the AOC, and generally proceed west to east. In addition, wood (or other non-metal material) stakes will be placed at either end of the transect line, and at 100-foot intervals along its length. The detector will be used to conduct lateral sweeps perpendicular to the transect line as the line is walked. The sweep will cover a distance of 2.5 feet on each side of the transect centerline, to ensure the 5-foot spacing will achieve complete coverage of the study area. The location of visible projectile fragments and metal detector hits will be marked using orange, numbered survey flags for additional assessment. In addition to individual "hits," it is possible that areas exhibiting multiple metal hits or visible projectiles will be observed. The approximate boundaries of these areas will be marked with red survey flags, and the approximate boundary locations will be recorded. Visible projectile fragments will be manually removed as they are observed and placed in a 5-gallon bucket for recycling. Locations of the final flag placements will be measured recorded and photographed. The flagged areas will be identified on a site plan for inclusion in the final report.

4.8.3 Focused Soil Removal

After all transects have been walked, additional screening and focused soil removal will be conducted around the flagged areas. A grid square will be established around each discrete green flag. The grid square will extend 1.5 feet in each direction from the flag, creating a 3x3 foot square with the flag in the center. For larger areas of potential contamination denoted by pink flags, the grid square will be established a distance of 1.5 feet around the entire area bounded by the pink survey flags.

After removing visible projectile fragments, the grid square will be re-screened with the metal detector. If no additional metal detector readings are noted, no additional action will be taken, and the orange or red survey flag will be replaced with a green flag to note that the square has been screened clean. Focused soil removal will be conducted in each grid that has visible contamination that cannot be practicably removed by hand, and where metal detector readings are noted after the manual removal is conducted. Each of these grid squares will be excavated in lifts. The initial lift thickness will be 6 inches, but may be modified to comprise a greater lift thickness in the field based on observed conditions. After each soil lift is removed, contamination removal will be verified using field observations and a metal detector. Additional lifts will be excavated until no indications of contamination are noted by either visual observation or metal detector screening. A green survey flag will be placed at the excavation base to note that the grid square has been screened clean. Note that the remaining in-place soil will still be subject to screening during the mass excavation/screening process; therefore, no analytical samples will be collected for this effort.

Projectile fragments observed during the survey will be removed and placed in a common container for recycling. The soil removed will be placed in a temporary impacted soil stockpile, pending construction of the soil storage area (see Section 4.10). Once the soil storage area has been constructed, this material will be placed in the “Visibly Impacted” soil stockpile area.

4.9 SOIL EXCAVATION, SCREENING, AND SEGREGATION CRITERIA

Field screening data will be used to segregate soil based on indicators of potential contamination. These data include visual observations of projectile slugs/fragments, and XRF readings. Soil excavation for field screening will be conducted using a backhoe with a 2-CY bucket. Each bucket of soil will be evaluated using a non-invasive visual assessment of the soil at the top of the bucket, and taking one XRF reading (using direct in-situ measurement). If projectile slugs or fragments are observed, the slugs/fragments will be removed from the surface soil in the bucket to the extent practicable prior to taking the XRF reading. Based on the field screening data, the soil from each bucket will be placed in dedicated containers or end-dumps for replacement as backfill, or for transport to the appropriate area in the soil storage area. “Visibly Impacted” soil will be placed directly in a loader bucket for transport to the “Visually Impacted” cell within the soil storage area without individual backhoe bucket assessment. No material removed from the fill will be transported outside the AOC during the excavation/assessment phase.

The soil will be segregated using the criteria described below and the process outlined on Figure 8.

The following categories will be used to determine additional sampling requirements, and potential re-use or placement in soil storage areas. Sampling requirements for each soil type are specified in Section 10. Note that the action level for the XRF readings may be adjusted based on correlations developed during the pilot study, and refined as additional data becomes available during the assessment field work following agency approval.

Clean - If there are no visible fragments or other visible indications of contamination, and the XRF reading is either non-detect (ND) with a detection limit less than or equal to 25 ppm Lead, or detected at a concentration less than or equal to 25 ppm Lead, the corresponding bucket of soil will be considered clean and can be immediately used as backfill without any additional sampling or screening. This category will not apply unless the results of the Lead / Antimony Correlation study (see Section 4.7.4) are favorable. If the results are unfavorable, these soils will be treated as “Potentially Clean”.

Visibly Impacted – Soil or grubbing containing visible projectile slugs/fragments that cannot be practicably removed by hand. Examples of conditions that would preclude practicable fragment removal include gray coloration indicating Lead dust, numerous small fragments that are difficult to discern by visual observation and the presence of fragments within soil media that has a significant grain size distribution close to the fragment size. In these circumstances, it is important to separate this material from other “Potentially Impacted” soil (i.e. soil that exhibits no visual indications of contamination but has elevated XRF readings) both to potentially reduce the overall volume of soil requiring treatment, and to separate contamination characteristics that might be best treated/disposed by different methods. Impacted soil will be stored separately from impacted clearing/grubbing material in the storage cells.

Visibly Impacted / Potentially Clean – Soil that contained visible projectile slugs/fragments that were removed by hand such that no visual indication of contamination remained, AND has an XRF reading less than the impacted soil action level (presently 50 ppm Lead, pending results of the field correlation study).

Potentially Impacted – Soil that exhibits an XRF reading greater than the impacted soil action level (50 ppm Lead). This may include both soil that has no visible indicators of contamination, and/or soil from which visible projectiles slug/fragments are removed.

Potentially Clean – Soil that exhibits an XRF reading less than the impacted soil action level (50 ppm Lead), and greater than the clean soil action level (25 ppm Lead). This category will also apply to soils that otherwise screen "Clean" in the event that the results of the Lead / Antimony Correlation Study (See Section 4.7.4) are less favorable.

4.10 SOIL STORAGE AREA

Soil removed from area excavations will be temporarily stored on-site for further screening and analytical sample collection. The soil storage area will also include a cell for material from the initial 1,000 CY that is screened clean, but temporarily stored on site to make room in the fill area for concurrent excavation/backfill operations. The primary soil storage area will be located at the south end of the project site, at the location shown on Figure 7. In addition, a separate area will be designated for storing grubbing material that does not indicate signs of contamination based on visual observations and XRF screening readings.

4.10.1 Construction Details

The soil storage area will comprise multiple individual cells to store the various segregated soils. The general construction details outlined below are depicted on Figures 9 and 10. The storage cell design specified herein consists of four cells capable of storing at least 300 CY each (six individual 50-cy stockpiles), and one cell capable of storing 1,000 CY. The number of stockpiles generated within each cell will depend on the volume of contaminated or potentially contaminated material that is identified during the screening process. If additional storage capacity is needed, the stockpile height may be increased or other soil storage areas may be developed within the AOC.

The first construction element will be to place soil berms on the ground surface to create the individual cells. The material used to create these berms will consist of clean, unclassified fill that is free of oversize material that could puncture the liner material. Soil removed during the initial 1,000-cy excavation is suitable for this purpose, provided it has screened clean by visual assessment and XRF readings. The north end of the cells will be left open to facilitate truck entry. At the end of the characterization effort, if soil is to be left on site pending analysis of treatment/disposal options, berms will be constructed under the base liner at the north ends of the cells to contain each cell on four sides. As shown on Figure 9, the five cells are grouped in three sets, with each set separated by sufficient room to allow equipment access.

A base liner will be placed to cover the perimeter berms. The liner will be a minimum 20-mil petroleum resistant material (HDPE or equivalent) that meets the ADEC requirements for long-term storage specified in 18 AAC 75.370 and will to the extent feasible be salvaged from the existing field cover material. To create a continuous liner surface, individual sections of liner will be heat-fused or taped at the seams. The base liner may consist of a single continuous sheet, or may comprise three separate sheets corresponding to the three cell groups. Note that we have included a base liner in the design for the temporary storage cell to retain flexibility in use. The liner is not required for storing soil that is screened clean.

For each cell except the “Visually Impacted” soil cell, it is anticipated that the cell base will have to withstand multiple incursions by end-dumps and/or other soil placement equipment. For these cells, the base liner will be covered with a 6-inch layer of clean soil that is free of oversize or angular material that could damage the underlying liner. The soil comprising this layer may comprise a portion of the initial 1,000 cy removed from Fill A1 excavation, provided that the soil is screened clean and has been cleared of oversize and angular material that could damage the liner. A geotextile fabric or plastic construction fence will be placed over the base layer to mark the interface between clean base soil and “Potentially Impacted” soil placed in the cell.

A base liner will not be placed in the “Visually Impacted” cell due to a different method of soil placement in that cell, and concerns with impacting the clean base layer with presumably the most impacted soil portions from the excavation. The “Visually Impacted” soil cell will be placed in this cell by a loader that accesses the cell from the side, outside the storage area perimeter. If the soil volumes placed in this cell are larger than expected, accommodations will be made in the field to allow equipment to enter and exit the cell without damaging the base liner.

When soil is not actively being placed in the soil storage area, the contaminated and potentially contaminated soil and grubbing stockpiles will be covered with a minimum 6-mil reinforced cover. The cover will be secured around the perimeter using sandbags, tires, berms of clean soil, or other appropriate method. If necessary, ropes or netting will be used to secure the covers from wind damage. Even in the absence of observed wind damage, ropes or netting will be applied if the cell remains on site for more than 30 days after fill assessment activities are completed.

4.10.2 Soil Placement

Soil will generally be placed in the individual stockpile cells in individual 10-cy portions corresponding to an end-dump truck bed or other container capacity. The soil will be placed from back to front (south to north) in each cell. The equipment used to transport the soil will place the 10-cy portions to create 50-cy stockpiles. To verify the correct number of field screening and analytical samples to be collected from the stockpiles, the number and location of each truck-load of soil placed in the soil storage area will be tracked in the field notes. The stockpile will then be assigned an identification number that is marked both on a site plan and on a wooden survey stake placed in the stockpile.

Soil placement in the "Visually Impacted" cell may vary from this process in that volumes less than 10 CY may be transported directly from the excavation face to the storage cell in a loader bucket.

4.10.3 Stockpile Screening & Sampling

Table 2A of the ADEC's Draft Field Sampling Guidance (ADEC, 2010) provides recommended soil screening and sampling numbers for excavated soils. It is noted, however, that the ADEC stipulates this table applies to "excavated soils at petroleum contaminated sites. For non-petroleum contaminants, DEC may require a different frequency of screening samples depending on data use, contaminant type, site management decisions, remediation goals, and other site-specific factors." In context of these considerations, the following stockpile screening and sampling generally conforms to the ADEC guidance, but incorporates more rigorous sampling requirements for the "Potentially Impacted" stockpiles, as suggested by the ADEC, to account for the potential heterogeneous contaminant distribution characteristics of the discrete projectile slugs/fragments. In addition to the project samples described below, field duplicates will be collected at a rate of one duplicate for every 10 project samples.

Temporary Storage Cell – No additional screening or sampling will be conducted for these soils, as these will have already been screened clean before placement in the soil storage cell. This category will not apply unless the results of the Lead / Antimony Correlation study (see Section 4.7.4) are favorable. If the results are unfavorable, these soils will be treated as "Potentially Clean" as described below.

Potentially Clean Stockpiles – Soil that exhibits an XRF reading less than the impacted soil action level (50 ppm Lead), and greater than the clean soil action level (25 ppm). Field screening samples using the XRF and the homogenized bag measurement technique will be collected at a frequency of one sample for each 10 CY. Based on field screening readings, one analytical sample will be collected from each 200 CY of stockpiled soil. This frequency may be increased to one sample for each 50 CY of stockpiled soils depending on the results of the Lead/Antimony Correlation Study.

Visibly Impacted / Potentially Clean Stockpiles – Soil containing visible projectile slugs/fragments that can be removed by hand, AND has an XRF reading less than the impacted soil action level (50 ppm Lead). Field screening samples using the XRF and the homogenized bag measurement technique will be collected at a frequency of one sample for each 10 CY. Based on field screening readings, one analytical sample will be collected from each 50-cy stockpile.

Potentially Impacted Stockpiles – Soil that exhibits an XRF reading greater than the impacted soil action level (50 ppm Lead). Field screening samples using the XRF and the homogenized bag measurement technique will be collected at a frequency of one sample for each 10 CY. Based on field screening readings, one analytical sample will be collected from each 50-cy stockpile.

Visibly Impacted Stockpiles – No additional screening or sampling will be conducted for these soils, which contain projectile fragments and are assumed to require treatment and/or disposal. ADEC guidance states "Excavated soils taken to an ADEC-approved treatment facility are excluded from the field screening and laboratory sampling frequency in Table 2A."

4.11 SOUTH TARGET LINE BENCH EXCAVATION

The South Target Line Bench will be excavated prior to other areas at the site and analytical results will be reviewed with the agencies prior to backfilling or proceeding with excavation in other areas. The proposed actions for the south target line excavation area differs from the other areas of the site in that elevated Lead levels and Antimony concentrations have been documented in this area, and the 2008 composite sampling provided indications of the contaminant distribution (see Figure 11). Based on the May 2010 field screening data the lateral distribution of contamination appears largely aligned with the former target line bench with the highest levels observed beneath the inferred location of the former target line array. The vertical extent of contamination has not been established. The proposed action at this location is removal of the target line bench soils, using a bucket-by-bucket assessment to segregate soil for potential reuse, analytical sampling, and/or disposal as impacted material.

4.11.1 Surface Preparation

Surface preparation comprises demarcating the general area for soil assessment/removal, and clearing vegetation from the study area. The impacted soils appear to be largely contained within an area measuring 60 feet by 20 feet that corresponds to the area directly beneath the inferred former target line location. . However, the removal area will encompass the entire former bench location and will be confirmed with ADEC and USEPA staff prior to beginning work. The general soil removal area limits will be identified using the steel rebar placed in 2008 around the excavation limits, the raised ground surface forming the remaining bench soil, and comparison of existing site features to aerial photographs and ground photographs taken prior to and during the 2008 earthwork. The excavation limits to the north, east, and south were generally demarcated by an ADEC representative (Robert Weimer) during a September 17, 2010 site visit. Note that the northern extent will be advanced to a safe distance from the south stadium wall to avoid jeopardizing the stadium's structural stability. As evident in site photographs, the west end of the bench may be more difficult to establish, due to the gradual slope of its leading edge, and the tapering height at the south end. Wood stakes will be placed at the corners of the proposed study area, and will be located using swing-tie measurements from the surveyed control points. Wood stakes will also be placed at either end of the inferred former target line, which has been determined by ADEC to be about 3 feet east of the west edge of the 11-foot wide target line bench. These stakes will be used to locate the initial excavation before the mass assessment/removal, and the confirmation screening/sample transect lines after the removal action.

The assessment/removal area will be cleared of grass and vegetation prior to performing initial surface evaluation/excavation. Vegetation will be cut sufficiently short to allow visual assessment of the ground surface, but will avoid disturbing the soil or entraining bullet fragments to the extent practicable. Cuttings will be bagged and disposed of at the local landfill.

4.11.2 Initial Excavation

The initial action will be soil removal from areas with known Lead contamination. Based on data from the September 2008 excavation confirmation sampling (See Figure 11), and the May 2010 field correlation study, the highest remaining concentrations are on the former bench, beneath the inferred former target line location. The initial excavation will consist of soil removal to a depth of 1 foot bgs along a 10-foot wide strip beneath the former target line location, and removal to 0.5 foot bgs along 5-foot wide strips directly east and west of the 1-foot excavation. In addition, selective excavation may be conducted at this time to remove soils that exhibit visible indications of contamination (e.g. projectile slugs or fragments). The soil removed from this initial excavation effort will be placed in the “Visually Impacted” cell within the soil storage area. Note that all soil removed from the South Target Line Bench will be stored in separate stockpiles than soil removed from the fill areas (and cut areas, if soil is removed from these area(s)).

4.11.3 Surface Survey

A surface survey using a metal detector and visual assessment will be conducted along linear transects spaced at 5-foot intervals (see Figure 6). Prior to the survey, the end of each transect line will be established using measurements taken from the marked excavation corners, and assigned a location. Each transect line will be walked by a two-person field team, applying the equipment and methods detailed in Section 4.8.

The location of visible projectile fragments and metal detector hits will be marked using orange, numbered survey flags. In addition to individual “hits,” it is possible that areas exhibiting multiple metal hits or visible projectiles will be observed. The approximate boundaries of these areas will be marked with red survey flags. Visible projectile fragments will be manually removed to the extent practicable and placed in a 5-gallon bucket for recycling. Unlike the fill and cut area surface survey, the marked areas will not be selectively excavated to remove impacted soil. Instead, the survey results will be used to segregate the surface soil during the bucket-by-bucket assessment. The top bucket of soil removed from each flagged area will be transported to the "Visually Impacted" storage cell for the South Target Line Bench soils.

4.11.4 Soil Assessment and Excavation

Soil that is initially screened clean will be considered "Potentially Clean" pending the results of the Lead / Antimony Correlation Study described in Section 4.7.4. If the laboratory results confirm that the soil is below the action levels for both Lead and Antimony, the soil will be used as fill for other on-site fill areas, or replaced at the south target line bench as needed for structural landscaping. Clean soil that will be replaced at the South Target Line Bench area will be temporarily stored adjacent to the excavation and/or at a designated area within the Soil Storage Area. No material removed from the excavation area will be transported outside the AOC during the excavation/assessment phase.

The South Target Line Bench excavation will be extended to a level even with the prevailing grade of the adjacent cut field surface (Cut A on Figure 2). This depth will be variable over the width and length of the excavation area. This minimum depth will be reached, even if shallower lifts indicate the presence of clean soil. Additional focused excavation will be conducted if indications of contamination are observed based on visual observations, metal detector readings, XRF meter screening, or confirmation sample results.

4.11.5 Confirmation Screening and Sampling

The confirmation screening and sampling process will consist of three sequenced components, as discussed below. If indicators of contamination are noted at any stage in the process, additional focused soil removal and screening will be conducted using the process described in this section. Once all confirmation samples contain Lead and Antimony concentrations less than the project ARARs, the south target line bench can be further modified for the proposed site development needs.

Metal Detector Survey. The excavation base and east sidewall will be assessed using a metal detector and visual assessment along linear transects spaced at 5-foot intervals. Prior to the survey, the end of each transect line will be established using measurements taken from the marked excavation corners and survey control points. Each transect line will be walked by a two-person field team, applying the equipment and methods detailed in Section 4.8.2. If the metal detector survey identifies areas of residual contamination, these areas will be further excavated prior to conducting additional confirmation sampling activities.

Transect Line Screening and Sampling. The excavation base beneath the former target line bench will be assessed using XRF readings collected along three transect lines. The area beneath the former target line bench will be marked off to a width of 11 feet, using the stakes and measurements conducted during the Surface Preparation (see Section 4.11.1). The transect lines will be established in a generally north-south direction corresponding to the inferred orientation of the former target line. As shown on Figure 12, the lines will be positioned at distances of 0 feet, 3 feet, and 7 feet from the west edge of the target line bench. Each transect line will be sampled at 4-foot intervals, using the bag screening method (see Section 10.3.2) to collect XRF readings. A total of twelve (12) project samples will be selected for laboratory testing based on XRF readings: eight samples will be selected from the 3-foot transect line, and a total of four samples will be collected from the 0-foot and 7-foot transect lines.

A similar approach will be used to screen and sample the east sidewall of the excavation. Soil samples will be collected at 4-foot intervals along the sidewall. Each sample will be collected from the soil at that location most likely to be impacted based on field observations, with the objective of identifying contamination that remains in the former target line backstop soil. The samples will be screened using the XRF and bag screening method. The four samples exhibiting the highest XRF readings will be submitted to the project laboratory for analytical testing. At the completion of the transect screening and sampling activities, each sample location will be established using swing ties from the excavation rebar markers, or other surveyed control points.

Grid-Based Screening and Sampling. A grid-based screening and sampling method will be applied to the excavation base outside the area beneath the former target line bench. As shown on Figure 12, this area will be divided into grid squares with a 10-foot node spacing. Each grid square will be visually assessed, and one screening sample collected from the center. The samples will be screened using the XRF and bag screening method. The four samples that exhibit the highest XRF readings will be submitted to the project laboratory for analytical testing.

4.12 FILL AREA EXCAVATION

The characterization approach for the Fill A areas (Areas A1, A2, and A3) is complicated by the uncertainty in both the presence/absence of contamination in the fill, and the volume of such potential contamination; as well as the possibility of significant dilution of impacted soil with large volumes of non-impacted soil. The proposed characterization approach for the fill areas therefore includes the surface survey described in Section 4.8, followed by near-complete removal for field screening and segregation. Based on screening data, soil will be either replaced in the excavation as backfill (pending the results of the Lead / Antimony Correlation Study), stockpiled for additional analytical sampling, and/or designated for treatment and disposal. Fill areas A2 and A3 will be excavated first, followed by excavation of the much larger fill area A1.

4.12.1 Fill Area A1

The soil in Fill Area A1 will be evaluated using the methods described in Section 4.9.

Observations of the soil profile along the excavation face will also be used to segregated soil.

Note that to make room in the excavation, the first task will be to remove, screen, and temporarily stockpile a volume of soil equaling two days of excavation. Assuming 500 CY per day of soil excavation and screening, this initial task will entail removing approximately 1,000 CY for screening. As shown on Figure 7, this initial volume will be excavated from the southwest end of Fill A1 area, although the location may be adjusted based on site conditions and equipment logistics. The initial soil that screens clean will be placed in a dedicated temporary storage cell in the soil storage area. Soil that exhibits indications of contamination, based on visual observation and/or XRF readings, will be segregated as described above.

After the initial excavation effort, subsequent soil will be removed in sections, as shown in Figure 7. For planning purposes, we assume that each section has a volume of 500 CY, and that work will be completed sequentially from the southwest corner. The soil that is below cleanup levels (based on field screening and/or laboratory analyses) from each section will be replaced in the initial excavation area at the southwest end. An effort will be made to replace clean grubbing in largely the same location as initially encountered, and to ensure that grubbing material is not replaced in the fill directly beneath the proposed soccer field surface. This may entail stockpiling of clean grubbing material within the AOC prior to replacing in appropriate backfill sections.

4.12.2 Fill Areas A2 and A3

The Fill A2 and A3 Areas will be assessed using the same general process as Fill A1.

4.13 SITE RESTORATION

4.13.1 Backfill / Compaction

Site restoration will consist largely of restoring the excavated fill areas to be re-developed as a soccer field and support areas. Soil that is removed from the fill areas will be replaced, subject to field screening results or stockpile sampling results that satisfy the clean soil criteria outlined herein. Depending on the volume of impacted soil generated that requires additional treatment, additional clean soil may need to be imported to complete the site restoration. Soil will be compacted as necessary for the intended end use. The means and methods of soil placement and compaction are outside the scope of this Cleanup Plan, except to specify that such methods do not result in transport of impacted material outside the AOC, and that only soil that is determined to be clean be replaced in the excavation. It is noted that other requirements likely apply to these actions (e.g. storm water pollution prevention plans, fill-and-grading permit, etc.) which are outside the scope of this plan.

4.13.2 Post-Construction Survey

During the course of the work, the boundaries of each of the fill and excavation areas will be marked and tracked during and through completion of the work. At the conclusion of the site characterization effort, a survey of key project features, including the boundaries described above, will be conducted by a professional surveyor registered in the state of Alaska. The survey will include delineating the boundaries of the fill areas replaced in Fill A1, A2, and A3 areas; the south target line bench excavation; and any other areas where soil is permanently removed or placed.

5.0 WASTE MANAGEMENT PLAN

Waste streams for this project will include projectile slugs/fragments, impacted soil, used personal protection equipment (PPE), and other unregulated soil waste.

5.1 RECOVERED PROJECTILES AND FRAGMENTS

Projectile fragments may be accumulated through manual recovery during site assessment activities or through mechanical separation during impacted soil treatment. The metal fragments will be placed in 5-gallon plastic buckets, and will be relinquished to a third party for recycling. Local vendors that may accept the fragments for recycling include Pratt Aviation and Hilltop Recycling. The materials designated for recycling are not considered waste subject to additional treatment or sampling prior to reuse.

5.2 IMPACTED SOIL STOCKPILES – ANALYSIS OF TREATMENT & DISPOSAL OPTIONS

Soil removed from the fill areas and south target line bench excavation area will be segregated as described in Section 4.9 and placed in corresponding stockpile cells within the soil storage area.

The precise scenario for treatment and disposal of hazardous waste and contaminated environmental media will be based on the volume of each material type encountered. Options include both onsite treatment with subsequent offsite disposal at a permitted Subtitle D landfill, or offsite treatment with offsite disposal at an appropriately permitted facility and Subtitle C landfill. Because there are no permitted Subtitle C landfills or treatment facilities in Alaska, all hazardous wastes must be transported to the lower 48 states by barge. The various options and plans are described below for various combinations of media and contaminants.

5.2.1 Soils Containing a High Concentration of Visible Bullets/Fragment

Soils containing a high concentration of visible bullets and fragments, on the order of 10 percent or more by volume will be segregated and managed as hazardous waste for offsite treatment at a permitted facility and disposed of in a Subtitle C landfill.

5.2.2 Soils Exceeding 400 mg/kg Total Lead and/or Visible Bullets/Fragments

It is assumed that these soils, without treatment, would have a high probability of failing the TCLP test for Lead. Treatment and disposal plans for these soils are described below depending on the volume recovered due to the high cost of transportation to a permitted Subtitle C facility for treatment and disposal.

5.2.3 Less Than 25 Cubic Yards (CY)

If less than 25 CY of such soils are encountered, the soils will be placed in lined, tarped roll-off bins for transportation under Hazardous Waste Manifest to a permitted Subtitle C facility where they will be treated to remove the Lead characteristic prior to disposal in a hazardous waste landfill cell.

5.2.4 More Than 100 CY

If more than 100 CY of such soils are encountered it will be treated onsite using process described in the Treatment Plan (to be prepared) to remove the Lead characteristic and the resulting soil will then be transported to and disposed of at a permitted Subtitle D landfill. It is anticipated that one sample will be collected from each 50 CY of treated soil and analyzed for TCLP-Lead to confirm the effectiveness of treatment. In the event that any treated soils still fail the TCLP criteria, then they will be transported for further treatment and disposal as hazardous waste at a permitted Subtitle C facility.

5.2.5 More Than 25 CY and less than 100 CY

If 25 to 100 CY of such soils are encountered, the soils maybe treated and disposed using either or a combination of the methods described in Section 5.2.3 and 5.2.4.

5.2.6 Antimony Impacted Soils

If soils are found which contain Antimony above the cleanup level, but which contain Lead below the cleanup level for Lead, these soils will be disposed of offsite at the municipal landfill.

5.3 UNREGULATED SOLID WASTE

Unregulated solid waste includes used PPE, used liner materials from the soil storage area, and other incidental unregulated solid waste generated during the site characterization and site restoration efforts. These materials will be transported by the earthwork contractor to the Anchorage Regional Landfill for disposal.

6.0 DOCUMENTATION

Documentation for this project will consist of field notes and a summary data report.

6.1 FIELD FORMS AND DOCUMENTATION

6.1.1 Field Logbook

Field notes will be used to document field activities and site data. Copies of all field notes will be included in the final closure report and will be provided weekly to ADEC. Information recorded in the daily field notes will include the following:

- name of person recording the field notes;
- date and time on/off site;
- names of other on-site environmental consultant representatives;
- name and time of site visitors, including client and agency representatives;
- list of earthwork equipment used at the site;
- narrative of general work elements conducted;
- instrument calibration information including:
  - date and time performed
  - calibration standards used (internal or external) and if external, what standard was used.
- photographs of site and field activities, including each analytical confirmation sample;
- a completed soil screening and sampling log that provides the following information, as applicable:
  - location description
  - depth, as applicable
  - time of collection
  - physical characteristics (e.g. soil classification, color, etc.)
  - presence or absence of visible contamination indicators
  - field screening method (e.g. in-situ or bag screening) and XRF reading(s)
  - field determination as clean, visibly impacted, or potentially impacted
  - truck/container information for transport to soil storage area
  - selection for analytical testing

  - sample identification number;
- a site sketch that shows:
  - general site features (fencing, paved areas, etc.)
  - delineation of study areas, including the areas worked each day
  - stockpile and excavation soil sample locations, including distances to control points
  - scale or approximate dimensions and north arrow; and
  - other information pertinent to the data collection objectives.

6.1.2 Photograph Log

Photographic documentation of significant visual field observations will be collected. Photographs will be taken of each sampling location, with sufficient additional photographs to obtain a perspective of the samples' relative position to on-site features. Additional photographs will be taken to record each element of the site characterization and removal action processes. The photos taken each day will be sorted for relevance and renamed/identified by date, location, type of subject, and relevance. Only selected photos will be placed in the photo log each day, others will be archived. Photographs will be recorded on a photograph log form. The Photo Log will include the time, date, and location of each photograph and may include direction, photo subject, and other relevant information.

6.2 SUMMARY DATA REPORT

At the completion of all closure activities, a summary data report will be prepared as described in Section 1.3.

7.0 CLOSURE SCHEDULE AND TIMEFRAME

Closure work is planned to begin as early as possible in 2011 as determined by weather conditions. The present target date to begin closure work is May 15, 2011.

The Treatability Study Work Plan will be submitted to EPA and ADEC not later than April 15, 2011.

The SOP for the use of the portable XRF unit will be submitted to EPA and ADEC at least two weeks prior to field use of the instrument and not later than May 1, 2011.

Onsite treatment, if implemented, would require four (4) to six (6) weeks to complete, followed by offsite disposal of treatment residuals. Offsite disposal of hazardous waste or contaminated environmental media can take four (4) to six (6) weeks due to the necessity for barge transport to the lower 48 states.

Based on the estimated May 15 start date, it is anticipated that all hazardous wastes and contaminated environmental media will be removed from the site by October 15, with final treatment and disposal completed by November 30, 2011.

8.0 COST OF CLOSURE

A cost estimate for the closure activities described in preceding sections has been developed and is discussed below. This estimate is based on the following assumptions:

- The soil volumes shown on Figure 2 will require excavation and screening
- 100 CY will be shipped for offsite treatment as hazardous waste and disposal at a Subtitle C facility.
- 500 CY will be treated onsite as described and, upon satisfactorily passing the TCLP test, will be transported to and disposed of at a permitted Subtitle D landfill.

It should be recognized that the volumes of soil for treatment and disposal are at this point assumptions used solely for the purpose of developing this cost estimate.

8.1 CLOSURE COST ESTIMATE

A summary estimate of closure costs is presented in Table 2. Details of this cost estimate are shown in Appendix B. The soil excavation, field screening and stockpiling or replacement as fill (based on field screening or subsequent laboratory testing up to the point of treatment and disposal, is identified as "EARTHWORK" on these estimates. Options for treatment and disposal are included in the estimate ("TREATMENT & DISPOSAL").

8.1.1 Earthwork Costs

Based on the Cleanup Plan, a preliminary scope of work for the initial work of creating stockpiles, screening the soil, moving impacted soil to stockpiles, placing and compacting backfill, and other general soil handling tasks has been developed. The basic equipment and labor rates that may be applicable for this construction were developed in consultation with a construction firm familiar with the project and are shown in Table B-2. Likewise, for each individual task, a generic "crew+equipment package" was developed, based on typical earthwork tasks of a similar nature. Some of these packages were slightly modified based on experience with similar remediation projects. An average value of 500 CY per day was used as the production rate for soil screening and transport to stockpiles or placement as compacted backfill based on input from an experienced earthwork contractor. There are numerous implicit assumptions in the labor and equipment rates used, production rate, soil volumes, etc. These assumptions may or may not be valid, depending on the actual field conditions encountered and on the project contracting strategies finally implemented.

8.1.2 Treatment

Costs for onsite treatment are based on consultations with treatment vendors and experience on similar projects.

8.1.3 Transportation and Disposal

For nonhazardous wastes (including treated soil containing greater than 400 mg/kg total Lead) it has been assumed that these soils can be transported to and disposed of at the Municipality of Anchorage landfill (a permitted Subtitle D facility) as solid waste in accordance with their *Contaminated Soil, Spill Residue, Drums, Tanks and Associated Product Piping Disposal Policy* (revised April 1, 2008). Visible Lead bullets and fragments will be removed to the extent practical prior to treatment and recovered for recycling as described in Section 5.1.

For hazardous waste, a quotation was obtained from Waste Management, Inc., for transportation to the hazardous waste facility at Arlington, Oregon, including treatment at their facility prior to disposal.

8.2 FINANCIAL ASSURANCE FOR CLOSURE

Since this closure is planned to be completed within one year of the approval of this Closure Plan, no financial assurance is proposed.

9.0 POST CLOSURE CARE REQUIREMENTS

Since clean closure is planned for the site, no post closure care or groundwater monitoring is needed. If clean closure is not achieved, a post closure plan will be required by EPA and institutional controls may be required by ADEC.

10.0 FIELD SAMPLING PLAN

The field sampling plan provides guidance for obtaining field data, collecting field screening and analytical samples, sample transport, and chemical testing protocol. The soil samples for this project will be collected, screened, and tested in material accordance with the ADEC's "Oil and Other Hazardous Substances Pollution Control" regulations (18 AAC 75, October 2008), and the ADEC's "Draft Field Sampling Guidance" (ADEC, 2010).

10.1 DATA TYPES

The data generated during the site characterization work will include physical descriptions, visual observations of projectile fragments, field screening readings, quantitative analytical measurements, and written records. Physical descriptions include GPS and survey data. Presence of Lead and Antimony concentrations will be assessed using qualitative visual observations, field screening using a metal detector and XRF meter, and chemical testing at an independent laboratory. Other field records include daily notes and photographs.

10.2 DATA USES

The general characterization objectives are to determine the presence or absence of bullet fragments and associated impacted soil, remove fragments to a limited extent, and segregate the potentially impacted soil based on apparent contaminant type and levels. The data generated by this effort will be used for the following purposes, as warranted and applicable based on the findings:

- Identify clean soils that can be re-used on site;
- Characterize the nature of impacted soil (fragments vs. sorbed/leached);
- Determine the volume of each impacted soil type / concentration range;
- Compare the screening and analytical concentrations to project ARARs;
- Assess alternatives for impacted soil treatment and/or disposal; and
- Support a clean closure determination from the EPA and ADEC.

10.3 FIELD SCREENING METHODS

Field screening for metals will be conducted using a NITON XL3t 600S X-Ray Fluorescence (XRF) meter in general accordance with EPA Method 6200, Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment.

Prior to use of the instrument, the users will complete a radiation safety training program and read and understand the Niton XL3t 600S User's Guide a copy of which will be maintained on site. When the instrument is used in accordance with the user's guide, there should be minimal radiation exposure. The manufacturer's published detection limits for a standard soil reference material are 13 mg/Kg Lead and 30 mg/Kg Antimony. During the Shannon & WIlson correlation study, the detection limits ranged from 6 ppm to 17 ppm for Lead, and 24 ppm to 38 ppm for Antimony. Given the physical characteristics of the project site soil (e.g. homogeneous sand) it is anticipated that detection limits close to the standard reference are theoretically practicable.

A site specific Standard Operating Procedure (SOP) will be developed to detail the use and calibration of the instrument for the purposes of this project. The SOP will be provided to the agencies for review as described in Section 7.0.

10.3.1 In-Situ / Direct Screening Method

This method will be used to take field screening readings directly from the soil surface, primarily during the bucket-by-bucket soil excavation/assessments. Before collecting each screening reading, the sample area will be prepared by removing surface debris such as rocks and vegetation. After each sample is tested, the probe will be inspected for damage and cleaned with a soft cloth.

If the in-situ mode is determined to be impracticable, due to estimated soil moisture greater than 20 percent, matrix interference, or other reasons, it may be necessary to use the "intrusive" screening mode. Screening using the intrusive mode will be conducting using a modified EPA 6200 method that considers the data use as a screening tool, and the prevailing site soil properties. The soil samples will be dried and if needed sieved (60-mesh sieve). Material that is retained on the 60-mesh sieve will be visually assessed for projectile fragments; if fragments are observed, the soil associated with the screening sample will be considered "Visually Impacted" for the purposes of soil segregation. If applied, the drying (using a microwave oven, heat lamp, paper towels or other means) and sieving will be done at the site field office.

10.3.2 Bag Screening Method

A modified in-situ method will be used to conduct screening for confirmation sampling of the soil stockpiles and south target line bench removal action. Data collected during the May 2010 field correlation study indicated the bag screening method provided a closer correlation to analytical results than the direct screening method, particularly at higher concentrations. The differences between the two methods are attributed to homogenization of the sample prior to screening/testing, and analytical testing of the soil within the bag, such that the bag screening reading and analytical soil sample are from the same portion of soil.

Bag screening samples will be collected by removing 2 vertical inches of soil from an approximately 2 inch by 2 inch area, taking care to not sample grain size larger than 3/8 inch. This will yield a soil volume of about 8 cubic inches, or about 4.4 fluid ounces; and a mass of about 178 g, assuming a soil density of 85 pounds per cubic foot for a silty sand. Although a smaller soil volume is desirable from a homogenization and screening perspective, the minimum soil mass to conduct both a total Lead and TCLP Lead analysis is about 165 g (enough to fill a standard 4-ounce glass jar).

The removed soil will be placed in a re-sealable bag and will be shaken to homogenize the soil. Once the soil is homogenized, the bag will be placed onto the ground surface and flattened to form a continuous uniform layer and the probe will be placed against the sample bag. Three measurements will be collected from separate locations on the bag. The three measurements will be reported, along with the average value. The bagged soil will be retained for use as a potential analytical sample.

For the purposes of this project, the presence of visible projectile slugs and fragments is indicative of waste that requires further treatment and/or disposal. Therefore, if slugs/fragments are observed in the bag, the corresponding sample location will be considered impacted and further screening or chemical analysis of that bag sample will not be conducted.

10.4 ANALYTICAL SAMPLE COLLECTION METHOD

10.4.1 General Sampling

Analytical soil samples will be collected using new plastic disposable spoons or clean stainless steel spoons or other clean stainless steel sampling equipment and transferred directly into laboratory-supplied 4-ounce amber glass sample containers. If the soil was screened using the bag method described in Section 10.3.2, the soil from the bag will be placed in the jar to be analyzed. Analytical soil samples will not be collected from soil that contains visible projectile slugs/fragments. Because these slugs/fragments are considered used munitions / solid waste per RCRA regulation, and have previously been shown to exhibit a hazardous Lead characteristic through TCLP testing, soil that contains these particles will require additional action to separate the particles or otherwise remove the hazardous characteristic. If particles are observed in bagged screening samples, the corresponding soil will be considered “Visually Impacted” for the purposes of further assessment, treatment, and/or disposal.

10.4.2 Excavator Bucket Sampling

Analytical samples may be collected directly from the soil in the excavator bucket for the field screening action level correlation study. Samples will be collected from the surface soil near the center of the bucket, at the location directly beneath the corresponding XRF direct screening reading. Care will be taken not to sample soil in contact with the excavator bucket sides.

10.4.3 Stockpile Sampling

Analytical samples will be collected from the stockpiles for characterization and to assess the need and type of additional treatment prior to disposal. The samples will be collected from freshly-exposed soil from representative depths within the stockpile.

10.4.4 Excavation Confirmation Sampling

Confirmation samples will be collected from the base and sidewalls of the excavation. The confirmation sample jars will be filled using the soil contained in the XRF screening sample bags, as described above.

10.4.5 Field Quality Control Sampling

Field duplicate soil samples will be collected at a rate of one sample for each 10 project samples. To collect duplicate samples, the corresponding XRF field screening sample bag will be filled to twice the volume required for the single project sample (about 320 grams in the bag). The soil will be homogenized in the bag, using the method for XRF bag screening samples outlined above, prior to filling the project and QA/QC sample containers.

10.4.6 Summary of Sample Quantities and Locations

The estimated number of analytical samples for each field task and the corresponding analyses are summarized in Table 3.

10.4.7 Sample Containers, Preservations, and Holding Times

Table 4 lists the sample containers, preservation requirements, and maximum holding times for each analytical method and sample matrix. Directly after collection, the analytical soil samples will be placed in insulated coolers through delivery to the project laboratory.

10.5 SAMPLE TRANSPORT / CHAIN-OF-CUSTODY PROCEDURES

Samples will be transported using a chain-of-custody (COC) protocol. Each analytical sample will be documented on a COC form, which will accompany the sample through the transport and analysis process. The COC form will be signed and dated by the field sampler at the time the sample coolers are sealed or delivered to the laboratory. If the cooler is sealed, the original form will be affixed to the inside lid of the cooler. The laboratory personnel receiving the samples will sign and record the date and time on the COC form, thereby accepting custody of the samples.

The receiving personnel at the project laboratory will process the samples via control procedures documented in the laboratory's Quality Assurance/Quality Control (QA/QC) plans and Standard Operating Procedures (SOPs) on file with ADEC. This process will include completing a form that documents the condition of the sample jars upon receipt, including cooler temperature.

10.6 LABORATORY ANALYSES

The analytical soil samples will be tested by an ADEC certified laboratory facility. Each sample will be tested for total Lead and Antimony using EPA SW-846 Method SW-6020A. A portion of each sample will be placed on hold for toxicity characteristic leaching procedure (TCLP) analysis by EPA SW-846 Method 1311/6010B. The TCLP analysis will be conducted for each sample containing total Lead equal to or greater than 100 mg/kg. If laboratory analysts note the presence of projectile fragments in a sample, the laboratory will also contact the environmental consultant prior to proceeding with the analysis of that sample.

The requested turnaround time will vary based on data use. Data that will be used for field decisions, including field screening correlation samples, confirmation samples from the south target line bench removal action, or any other situation requiring expedited results will be requested on a 1 or 2 day turnaround. Stockpile characterization samples will be tested on a standard 10-working day turnaround time.

The analytical sample results for this project will be presented by the analytical laboratory in Level II Data Deliverable packages. As part of the quality control procedures, a data quality assessment will be performed on the analytical data results, and ADEC's Data Review Checklist will be completed for each laboratory data package.

11.0 QUALITY CONTROL

The project's intended data uses and objectives are identified in the following sections. The data used for these purposes include screening-level field data and laboratory testing using EPA-approved methods.

11.1 FIELD EQUIPMENT SPECIFICATIONS AND CALIBRATION

The XRF meter and metal detector that will be used for this project are specified below, along with calibration procedures. Documentation of equipment calibration will be recorded in the field notebook.

11.1.1 NITON XL3t 600s XRF.

As described in Section 10.3, a site specific Standard Operating Procedure (SOP) will be developed to detail the use and calibration of the instrument for the purposes of this project and will be provided to the agencies for review as described in Section 7.0. The XRF will be calibrated using both internal and external standards in accordance with the XRF User's Manual. A copy of the XRF User's Manual will be maintained on site

11.1.2 METAL DETECTOR

The instrument specifications are contained in the manufacturer's user manual, which will be maintained on site. Because the metal detector is used to determine the presence/absence of projectile slugs/fragments, the calibration of the instrument is limited to determining the instrument's sensitivity to particle size and depth in the soil matrix. A site-specific study to determine these limits is outlined in Section 4.7.2. In addition, each subsequent day the metal detector is used, the instrument sensitivity will be verified using the minimum particle size and maximum depth constraints established during the initial study.

11.2 QUALITY CONTROL SAMPLES

Quality control for the laboratory data will be assessed using field and internal laboratory QC samples.

11.2.1 Field QC Samples

Duplicate samples will be used to assess both the sample matrix heterogeneity and the variability in sample collection procedures. Field duplicate/QC samples will be analyzed at a rate of one QC sample per 10 project samples for each fixed-laboratory analytical method and sample matrix. The QC samples will be numbered sequentially with the project samples and submitted to the project laboratory for the same analyses as the corresponding primary sample.

Based on method requirements for metals analyses, no trip blanks or temperature blanks will be included in the sampling and analysis program.

11.2.2 Laboratory QC Samples

Laboratory QC requirements are defined by the laboratory's laboratory chemical quality program, and by the individual analytical protocols they use. A variety of internal laboratory QC samples is used to assess that the analyses are in control. These include method blanks, laboratory control samples (LCS), and matrix spike / matrix spike duplicate (MS/MSD) samples.

Method blanks are clean, interference-free samples consisting of the same matrix as that of the corresponding project sample batch. They are used to monitor potential laboratory contamination, and will be included in each preparation batch of samples processed by SGS. The acceptance criterion for method blank samples is that all positive detections shall be less than one half the laboratory quality objective (LQO) for that sample. If concentrations in a method blank exceed this level, the corresponding project samples may be qualified as biased high during the analytical data review process.

Laboratory Control Samples (LCS) are prepared by spiking method blank samples with project-specific target compounds. Data from these analyses provide a measure of the inherent accuracy and precision of the analytical method. LCS analyses will be performed by SGS at a frequency of one per preparation batch of no more than 20 samples. Acceptable LCS-analyte recovery ranges are presented in Table 5.

MS/MSD samples are prepared in a similar manner as LCS samples, but using a portion of the sample matrix from the project sample. MS/MSD samples are used to assess matrix interference effects, sample homogeneity, and to a lesser extent the analytical precision and accuracy.

11.3 DATA QUALITY OBJECTIVES

Data quality will be assessed using quantitative and qualitative Data Quality Objectives (DQOs). The quantitative DQOs for this project will be used to assess precision, accuracy, and completeness of the analytical data. Qualitative DQOs include comparability and representativeness.

11.3.1 Precision

Precision is the mutual agreement of discrete measurements of the same property, under similar conditions. For the purposes of this program, precision will be expressed as the relative percent difference (RPD) between primary and duplicate analytical samples. An assessment of the laboratory precision will be performed through calculation of the RPD between primary and duplicate analytical samples, with a quality assurance objective for this program of 30 percent. The RPD will be calculated by dividing the absolute difference between the values by their mean and multiplying by 100:

$$RPD = \frac{|X_1 - X_2|}{(X_1 + X_2)/2} (100)$$

Where X1 and X2 are the primary and duplicate values, respectively.

11.3.2 Accuracy

Accuracy measures the average or systematic error of an analytical method, and is expressed as the degree of agreement of a measured value with the true or expected value of the measured quantity. The accuracy of control sample measurements is generally expressed as a percent recovery (%R). For surrogates and samples without a background level of the analyte in the sample matrix, such as reference materials and laboratory control samples (LCS), the percent recovery is calculated from:

$$\%R = \frac{X}{T} (100)$$

Where X = measured concentration

T = true or expected concentration

The percent recovery for measurements in which a known amount of analyte is added to an environmental sample (such as a MS/MSD) is calculated from:

$$\%R = \frac{X - B}{T} (100)$$

Where B = background concentration of spiked analyte in environmental sample

X and T are defined as above

Accuracy will be determined for each analytical method by SGS, and results will be included in their laboratory report. The LCS and MS/MSD results for each analytical batch will be reviewed and compared to the laboratory reporting limits.

11.3.3 Sensitivity

Analytical sensitivity is evaluated using LQOs. The laboratory's target LQOs to be determined in soil samples are presented in Table 5.

11.3.4 Completeness

Completeness is the percentage of usable measurements, compared to the total number of measurements requested. Completeness will be calculated using the following formula:

%C = (V/n)*100

Where %C = Percent completeness

V = Number of valid measurements

N = Total no. of attempted/requested measurements

A valid sample result is one that meets the precision and accuracy DQOs for the associated quality control data. Estimated (J-flagged) results will be considered valid data. The project objective for percent completeness is 95 percent of analytical soil data.

11.3.5 Representativeness & Comparability

Representativeness describes the degree to which data characterize the actual conditions at the site or parameter variations at a sampling point. Representativeness is a qualitative parameter that will be evaluated using a holistic approach and information from both field and definitive chemical data. Representativeness associated with soil heterogeneities and sample collection/analyses will be assessed by calculating the RPD of field duplicate analysis.

Data from blank samples will be examined to determine if sample contamination occurred either during or after the sample collection. Method blank samples prepared by the laboratories will assess potential laboratory contamination. Contaminants measured in blank samples suggest that project sample results may not represent the conditions at the sampling point.

Comparability will be maintained by consistency in sampling conditions, selection of sampling equipment and procedures, sample preservation methods, analytical methods, and data reporting measurement units.

11.3.6 Chemical Data Assessment

Data assessment is a process for determining the usability of data for stated project objectives, based on the completeness, correctness, consistency, and compliance of laboratory-generated chemical data. A limited data review will be conducted to compare laboratory performance to numerical DQOs. Results of the review will be documented in completed ADEC Laboratory Data Review Checklist forms. A separate checklist form will be completed for each deliverables package.

Chemical data will be provided by SGS in ADEC Level II Data Deliverables packages. Data verification will consist of checking each data package to ensure that all analyses requested on the chain-of-custody forms were performed and reported, all relevant laboratory internal QC data (including chromatograms where appropriate) have been provided, and that the specified analytical methods were used to test the samples.

12.0 REFERENCES

Alaska Department of Environmental Conservation, 2010, *Draft Field Sampling Guidance*, May.

Shannon & Wilson, 2009a, *Stockpiled Soil Removal, Kincaid Biathlon Range, Anchorage, Alaska, #AKR 00020 2952*. January 12.

Shannon & Wilson, 2009b, *Target Line Soil Sampling and Disposal, Former Kincaid Park Biathlon Range, Anchorage, Alaska*. March.

Shannon & Wilson, 2010, *Shallow Groundwater Determination, Former Kincaid Biathlon Range, Anchorage, Alaska.* March 29, 2010

TABLES

TABLE 1

CLEANUP LEVELS FOR CLEAN SITE CLOSURE

Compound of Concern	**SOIL**		
	ADEC Method 2 Cleanup Levels [a,b]		EPA Toxicity Characteristic Standard [d]
	Direct Contact[c]	Migration to Groundwater	
Antimony	41 mg/kg	3.6 mg/kg	NA
Lead	400 mg/kg[e]	NA	5 mg/L

(a) Most stringent Method 2 cleanup levels for the "under 40 inches" precipitation zone (18 AAC 75.341, October 2008)

(b) The direct contact exposure route encompasses soil ingestion and dermal contact, but is also considered protective of the fugitive dust inhalation exposure route

(d) Based on TCLP analysis, as listed in Table 1, 40 CFR 261.30

(e) Lead cleanup levels are 400 mg/kg for residential exposure

TABLE 2

SUMMARY COST ESTIMATE FOR CLOSURE

TASK ITEM	ESTIMATED COST
General Components	$39,290
Update site security	$10,000
Earthwork	$292,744
Offsite Treatment and Disposal as Hazardous Waste at a Subtitle C Facility	$60,000
Onsite Treatment and Offsite Disposal at a Subtitle D Landfill	$209,200
TOTAL ESTIMATED COST	**$551,234**

TABLE 3 -- SUMMARY OF FIELD SCREENING AND ANALYTICAL TESTING PROGRAM

FIELD ACTIVITY			FIELD SCREENING METHOD & FREQUENCY				ANALYTICAL SAMPLES (d)						
							PROJECT SAMPLES			FIELD DUPLICATE SAMPLES			LAB TURNAROUND TIME (e)
					XRF (c)								
Description	Sample Media	Sample Depth	Visual (a)	Metal Detector (b)	direct reading	bag method	Total Pb	Total Sb	TCLP Pb	Total Pb	Total Sb	TCLP Pb	
Surface Survey & Focused Soil Removal	Soil	Surface	continuous	continuous	-	-	-	-	-	-		-	-
Field Screening Action Level Assessment	Soil	Surface (f)	1/backhoe bucket (g)	-	1/backhoe bucket (g)	-	10	10	(h)	1	1	(h)	2-day RUSH
Fill Area Assessment	Soil	Surface (f)	1/backhoe bucket (g)	-	1/backhoe bucket (g)	-	-	-	-	-	-	-	-
South Target Line Bench Removal Action													
Trenching Assessment	Soil	Surface	each lift	each lift	every 5 feet (k)	min 2/ trench (2)	10 (m)	10 (m)	(h)	1	1	(h)	-
Removal Action (i)	Soil	Surface	each grid square	each grid square	1/ grid square (est 102) (n)	-	-	-	-	-	-	-	-
Confirmation - Excavation Base (o)	Soil	Surface	-	-	-	13 (p)	13 (r)	13 (r)	(h)	2	2	(h)	2-day RUSH
Confirmation - Excavation Sidewalls (4)	Soil	Surface	-	-	1/10 linear ft (s)	11 (p)	11 (t)	11 (t)	(h)	1	1	(h)	2-day RUSH
Stockpile Screening & Sampling (u)													
Temporary Storage Cell	Soil	12-18 in	-	-	-	-	-	-	-	-	-	-	-
Potentially Clean (XRF < 50)	Soil	12 - 18 in	continuous	-	-	1 / 10 cy	1/200 cy (u)			1 / 10 project samples			10-day standard
Visibly Impacted / Potentially Clean Potentially Impacted (XRF >50)	Soil	12 - 18 in	continuous	-	-	1 / 10 cy	1 / 50 cy			1 / 10 project samples			10-day standard
Visibly Impacted	Soil	-	-	-	-	-	-	-	-	-	-	-	

Notes:

- \- not applicable
- (a) Observation of projectile slugs, fragments, or gray coloration indicating pulverized "dust"
- (b) Garrett Ace 150 XLT instrument
- (c) NITO XL3t 600s X-Ray Fluourescence (XRF) instrument
- (d) Target Compounds and Analytical Methods:
  Total Pb - Total lead by EPA Method 6020A
  Total Sb - Total antimony by EPA Method 6020A
  TCLP Pb - Toxicity Characteristic Leaching Procedure Lead by EPA Method 1311/6010B
- (e) laboratory turnaround times are referenced to working days
- (f) Samples will be collected from the top of recovered soil in backhoe bucket
- (g) Backhoe bucket will hold estimated 2 cubic yards of soil
- (h) TCLP analysis will be conducted if total Pb concentrations are greater than 100 mg/kg
- (i) Screening conducted on a grid-specific basis to determine the need & depth of soil removal
- (Direct XRF readings taken from trench base after each lift where no indictors of contamination noted, based on visual observation and metal detector
- (m) Two samples from base of each trench; additional samples may be taken from base of shallower lifts with XRF < 100 ppm.
- (n) One XRF reading is collected from a random location in each grid square, after that square screens clean using visual and metal detector methods
- (o) Confirmation sampling is conducted after all grid squares are excavated and screened clean using visual, metal detector, and direct XRF readings
- (p) One field screening reading will be co-located with each confirmation sample
- (r) Excavation base: 2 samples for 1st 250 sf, 1 sample for each subsequent 250 sf (assume 3,000 sf). Sample locns based on systemmatic random sampling procedure
- (s) Screening interval applied independently to each lift interval in final excavation
- (t) Sidewalls: 1 sample per 20 linear feet, based on total excavation periphery (not individual lift depths) of 220 lf. Sample locations based on highest XRF screening
- (u) May increase to 1/50 cy pending results of Lead/Antimony study see text

TABLE 4 -- SOIL SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

Analyte	Method	Soil Samples			
		Container	Preservation	Temperature	Maximum Holding Times
Total Lead & Antimony	SW 846/6020A	4-oz. amber glass*	None	None	180 days
TCLP Lead	SW 846 1311/6010B	4-oz. amber glass*	None	None	180 days (28 days until extraction)

*Only one, 4-oz. amber jar needed to conduct both total and TCLP analyses

TABLE 5 -- DATA QUALITY OBJECTIVES FOR METALS ANALYSES IN SOIL

		Cleanup Level	Sensitivity		Precision	Accuracy
ANALYSIS/ANALYTE	Method		MDL	PQL	% RPD	(% recovery)*
Total Metals						
Antimony - mg/kg	EPA 6020A	3.6 mg/kg	0.031	0.1	20	80-120
Lead - mg/kg	EPA 6020A	400 mg/kg	0.062	0.62	20	80-120
TCLP Metals						
Lead - mg/L	EPA 6010B	5 mg/L	0.062	0.62	20	80-120

Notes:

* For surrogates and Laboratory Control Samples (LCS)

Sensitivity and surrogate values are based on historical laboratory capabilities.

MDL = Method Detection Limits

PQL = Practical Quantitation Limit

mg/kg = milligrams per killogram

mg/L = milligrams per liter

FIGURES

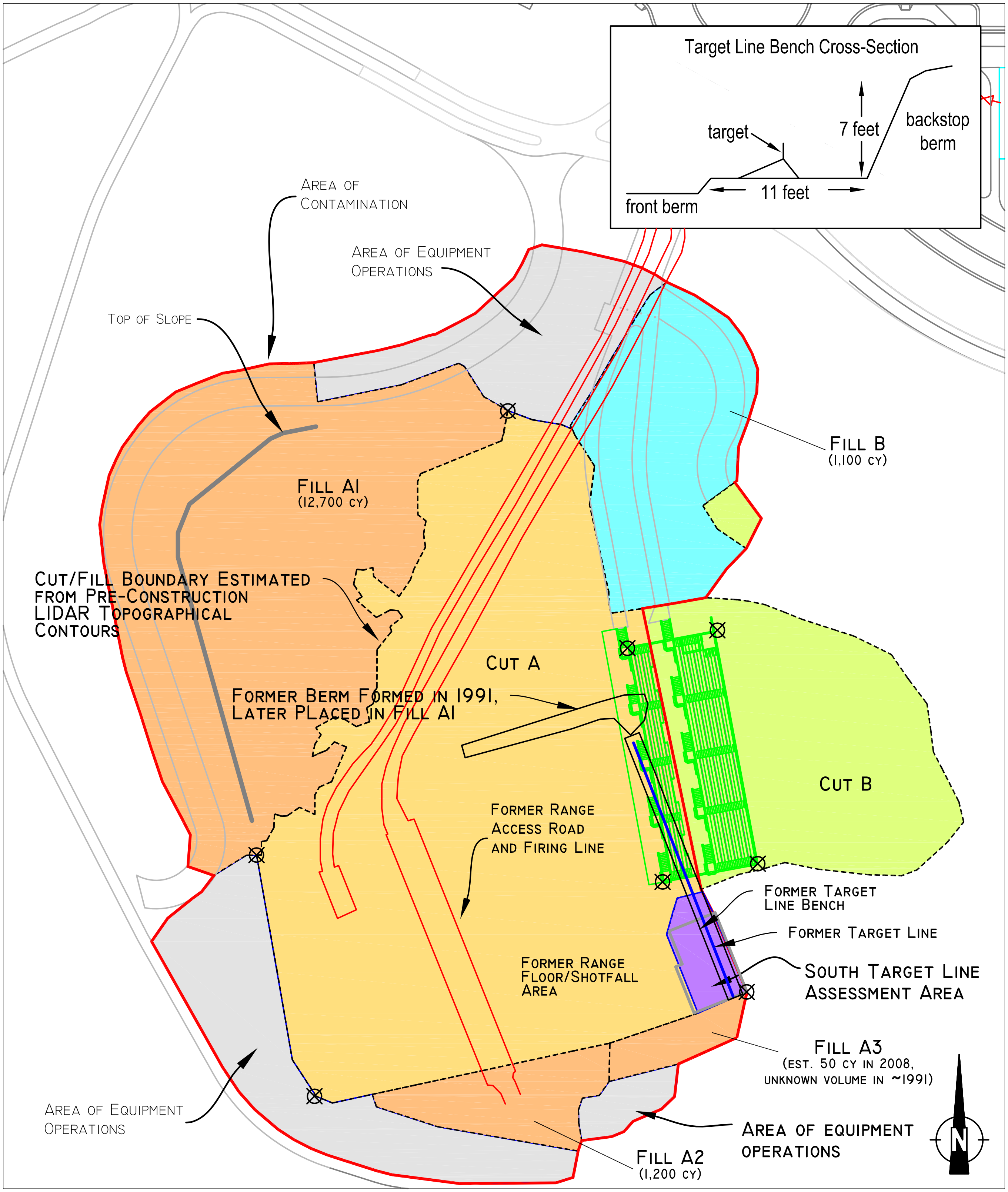
Source: Google Earth

ALTA GEOSCIENCES, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington

FORMER KINCAID BIATHLON RANGE
ANCHORAGE, ALASKA

SITE LOCATION

FIGURE
1



Base Map Provided by Land Design North

0 50 100 200

Approximate Scale in Feet

LEGEND

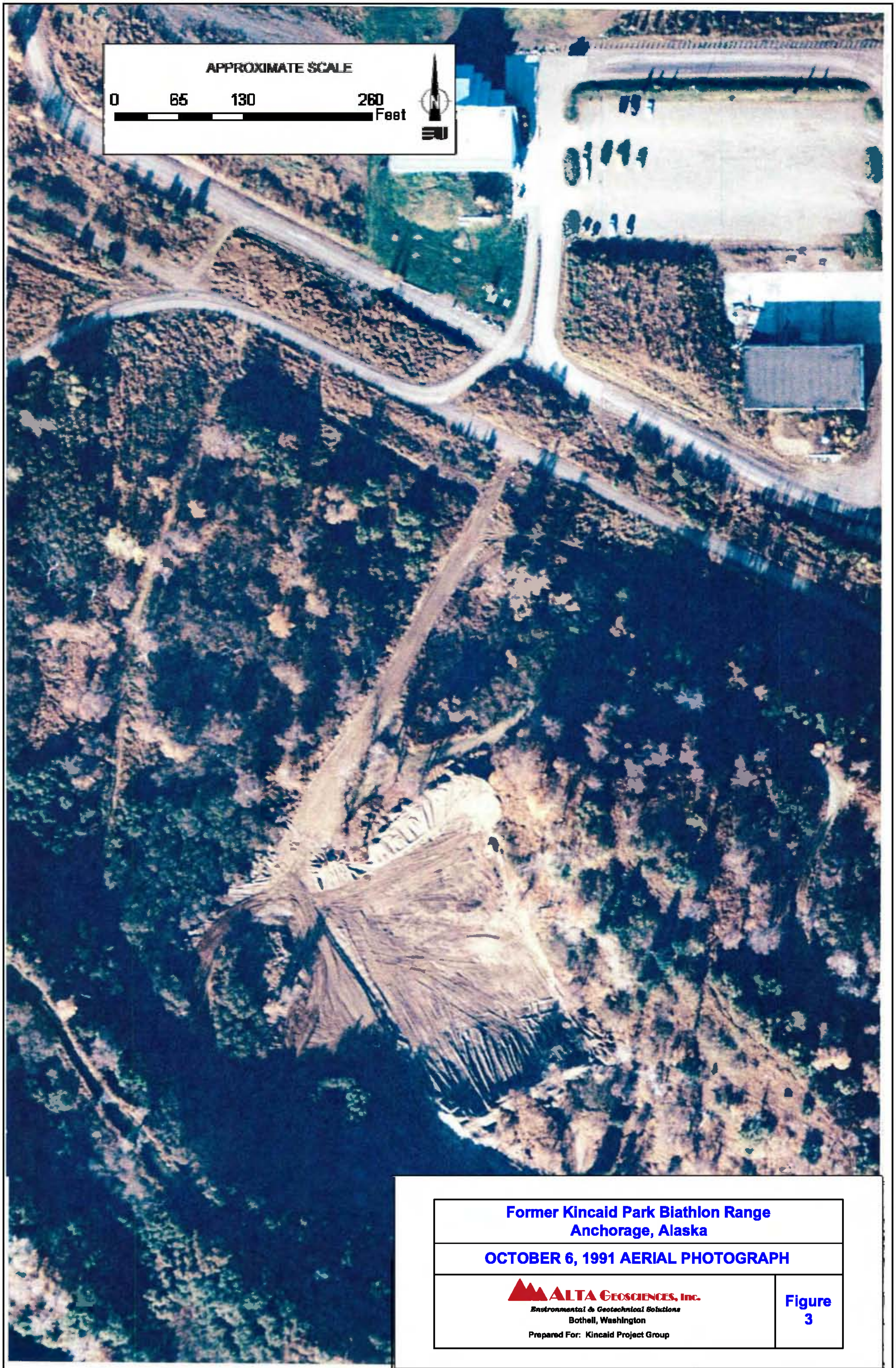
- Cut A / Fill A — Approximate Cut A/Fill A Area
- Cut B / Fill B — Approximate Cut B/Fill B Area
- Proposed Control Points to be established by survey prior to characterization work
- South Target Line Excavation Area (Sept. 2008)
- Area of Equipment Operations
- South Target Line Bench Assessment Area

Former Kincaid Park Biathlon Range
Anchorage, Alaska

SITE PLAN

ALTA Geosciences, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington
Prepared For: Kincaid Project Group

Figure 2

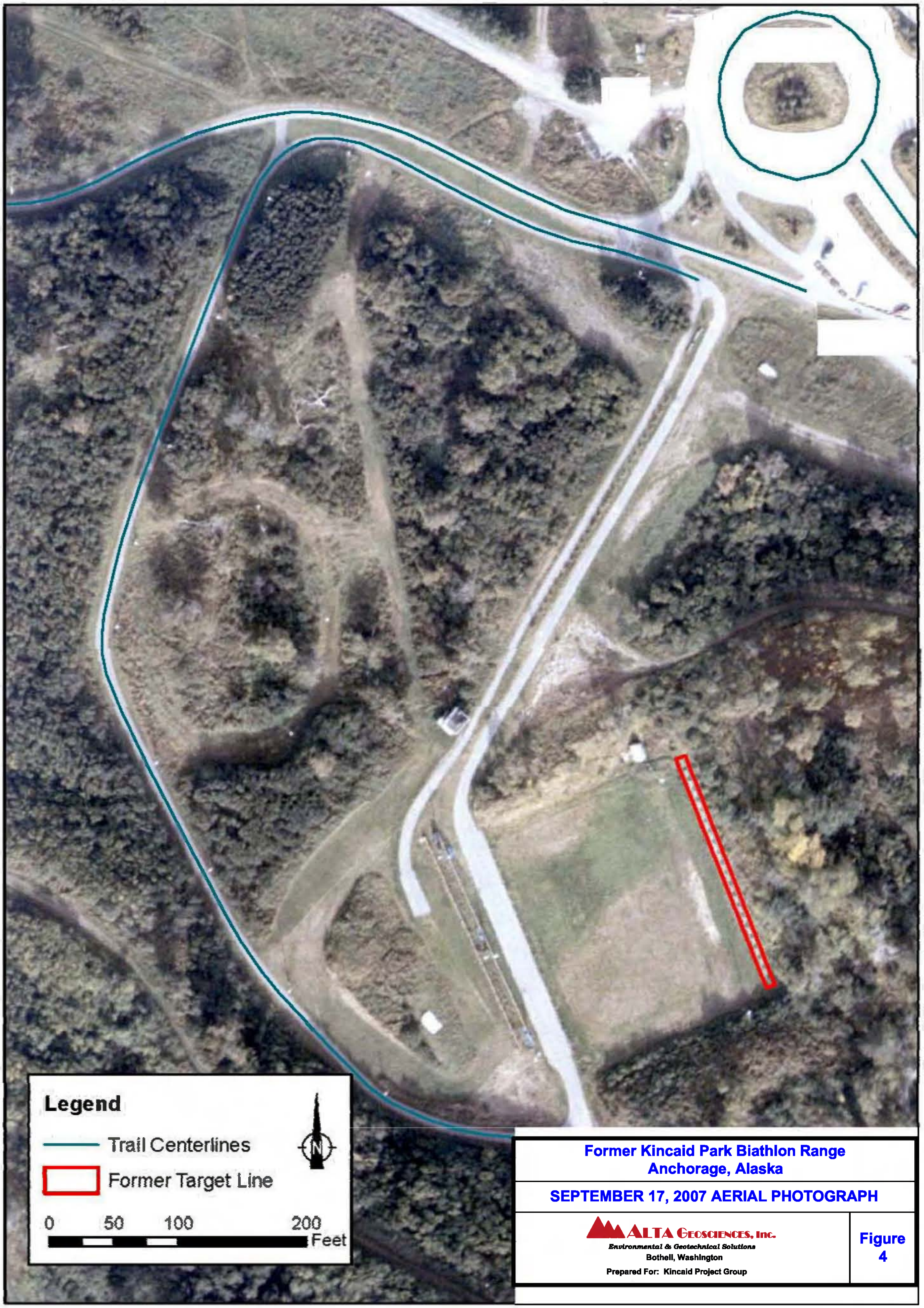


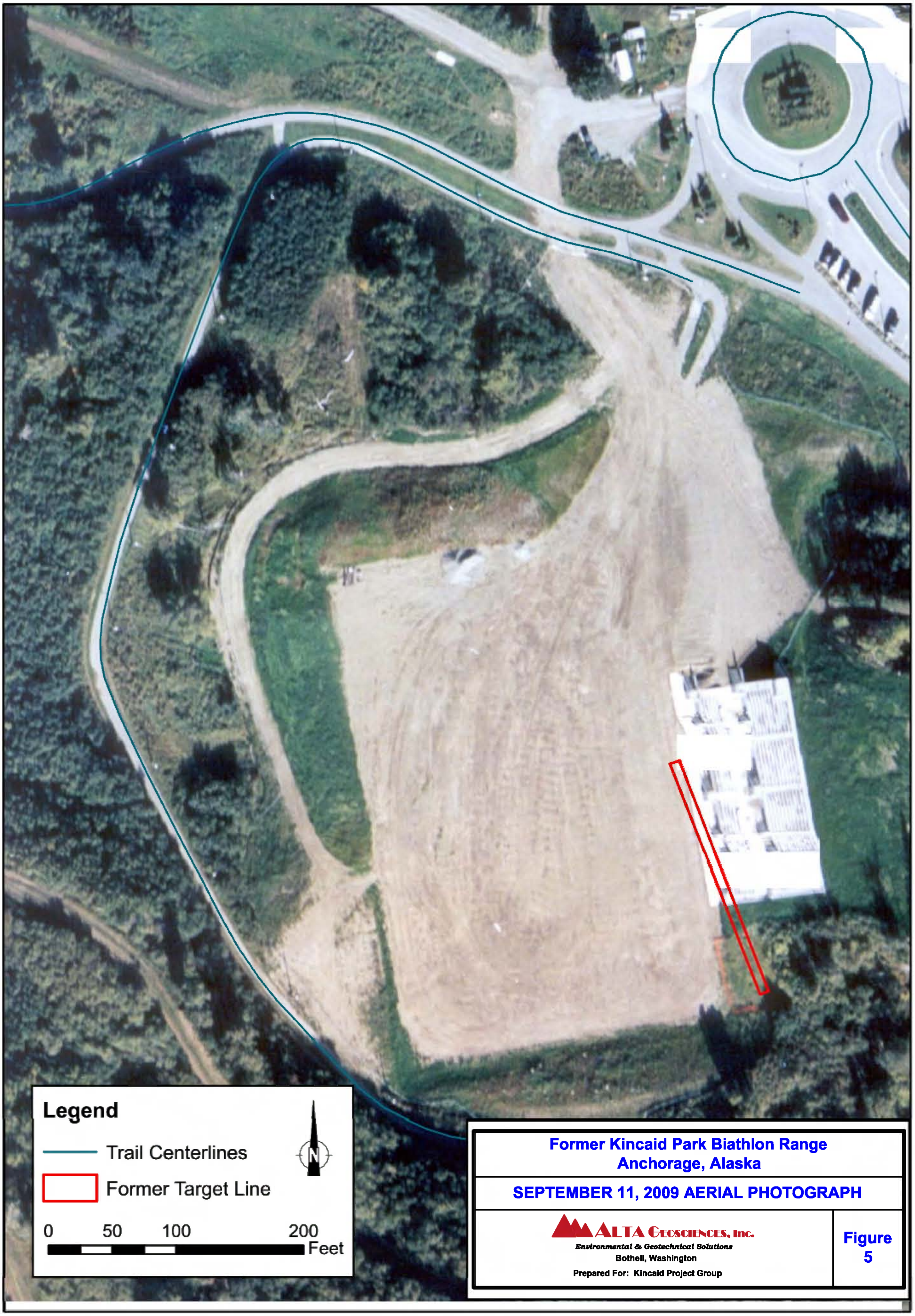
Former Kincaid Park Biathlon Range
Anchorage, Alaska

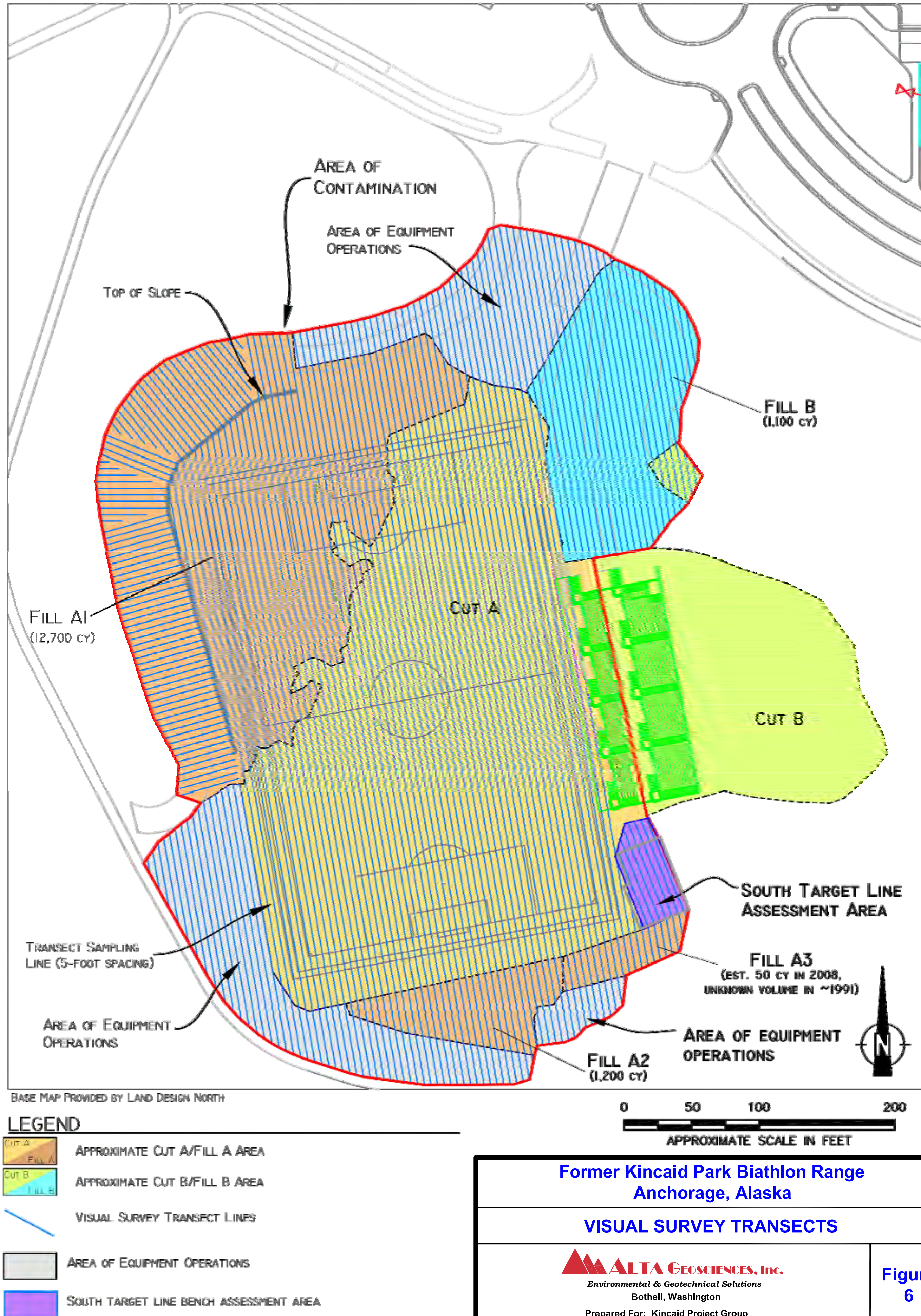
OCTOBER 6, 1991 AERIAL PHOTOGRAPH

ALTA GEOSCIENCES, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington
Prepared For: Kincaid Project Group

Figure 3


Legend
Trail Centerlines
Former Target Line
N
0
50
100
200
Feet
Former Kincaid Park Biathlon Range
Anchorage, Alaska
SEPTEMBER 17, 2007 AERIAL PHOTOGRAPH
ALTA Geosciences, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington
Prepared For: Kincaid Project Group
Figure
4


Legend
Trail Centerlines
Former Target Line
N
0
50
100
200
Feet
Former Kincaid Park Biathlon Range
Anchorage, Alaska
SEPTEMBER 11, 2009 AERIAL PHOTOGRAPH
ALTA GEOSCIENCES, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington
Prepared For: Kincaid Project Group
Figure
5

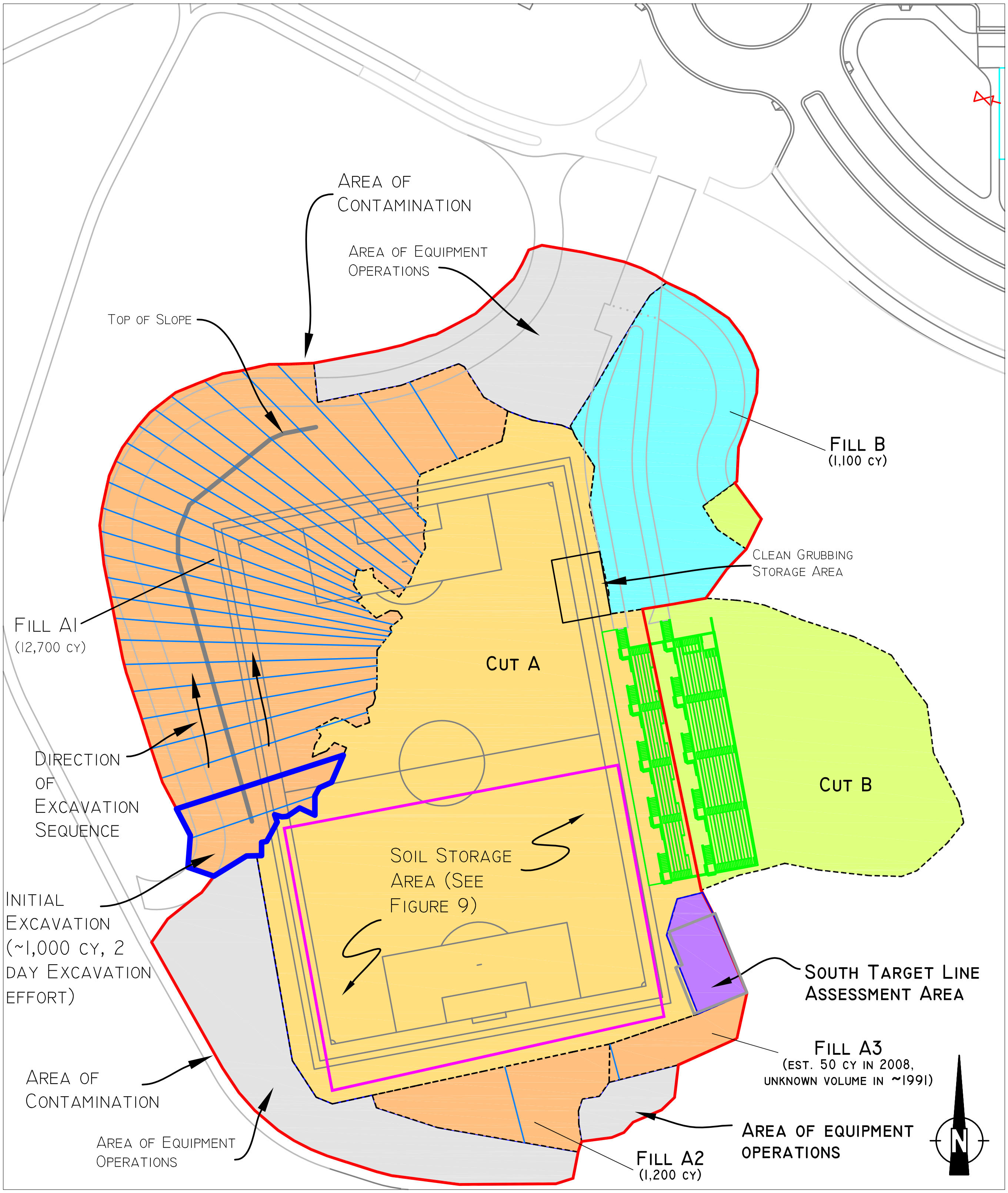


Former Kincaid Park Biathlon Range
Anchorage, Alaska

VISUAL SURVEY TRANSECTS

ALTA Geosciences, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington
Prepared For: Kincaid Project Group

Figure 6



Base Map Provided by Land Design North
map information provided by Shannon & Wilson

0 50 100 200
APPROXIMATE SCALE IN FEET

LEGEND

- Cut A / Fill A — Approximate Cut A/Fill A Area
- Cut B / Fill B — Approximate Cut B/Fill B Area
- Proposed Excavation Sections ~500 cy each
- Area of Equipment Operations
- South target line bench assessment area

Former Kincaid Park Biathlon Range
Anchorage, Alaska

PROPOSED SOIL REMOVAL & SCREENING PLAN

Alta Geosciences, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington

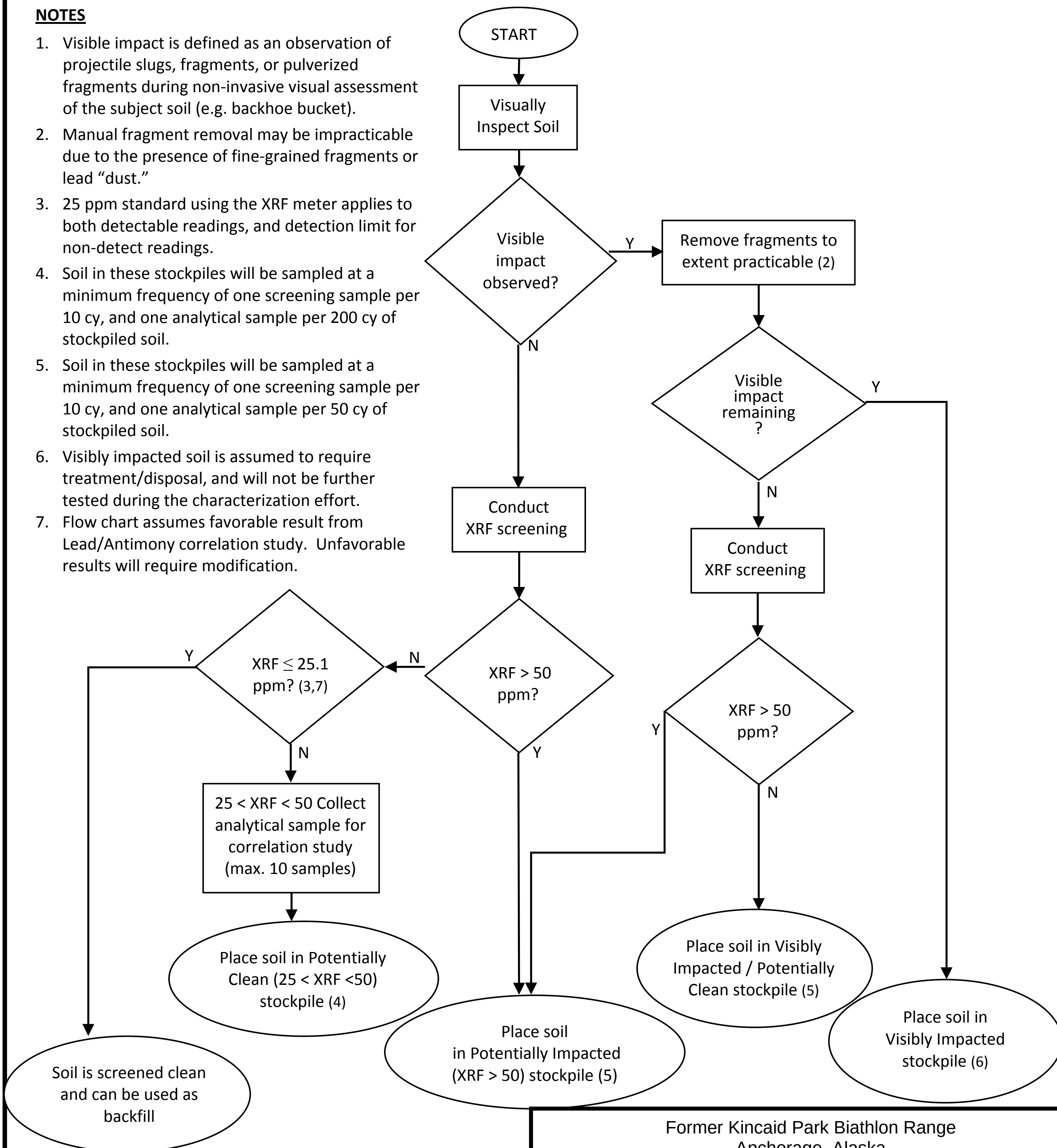
Prepared For: Kincaid Project Group

Figure 7

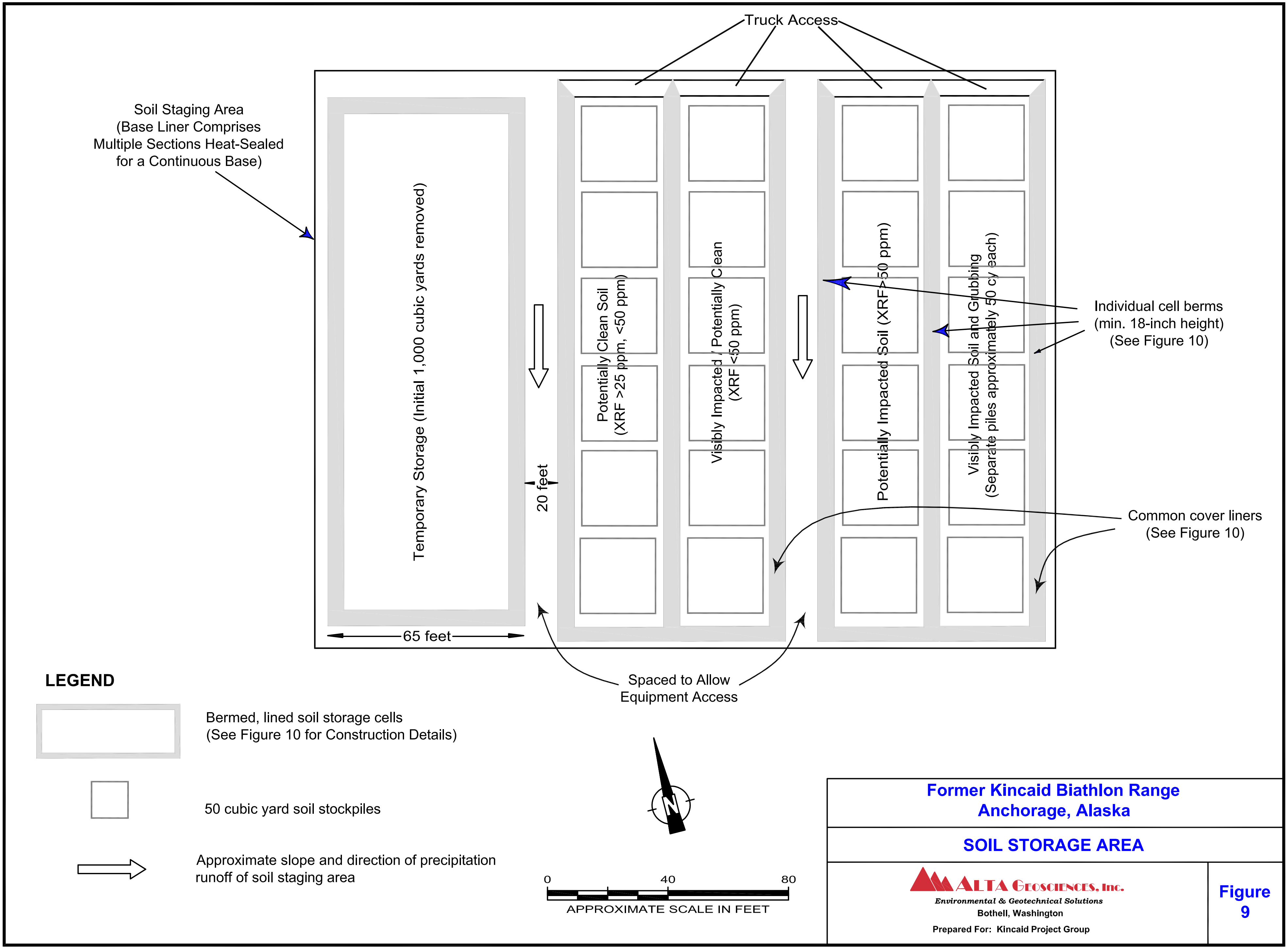
DECISION MATRIX FOR SOIL SCREENING & SEGREGATION
INDIVIDUAL BACKHOE BUCKET

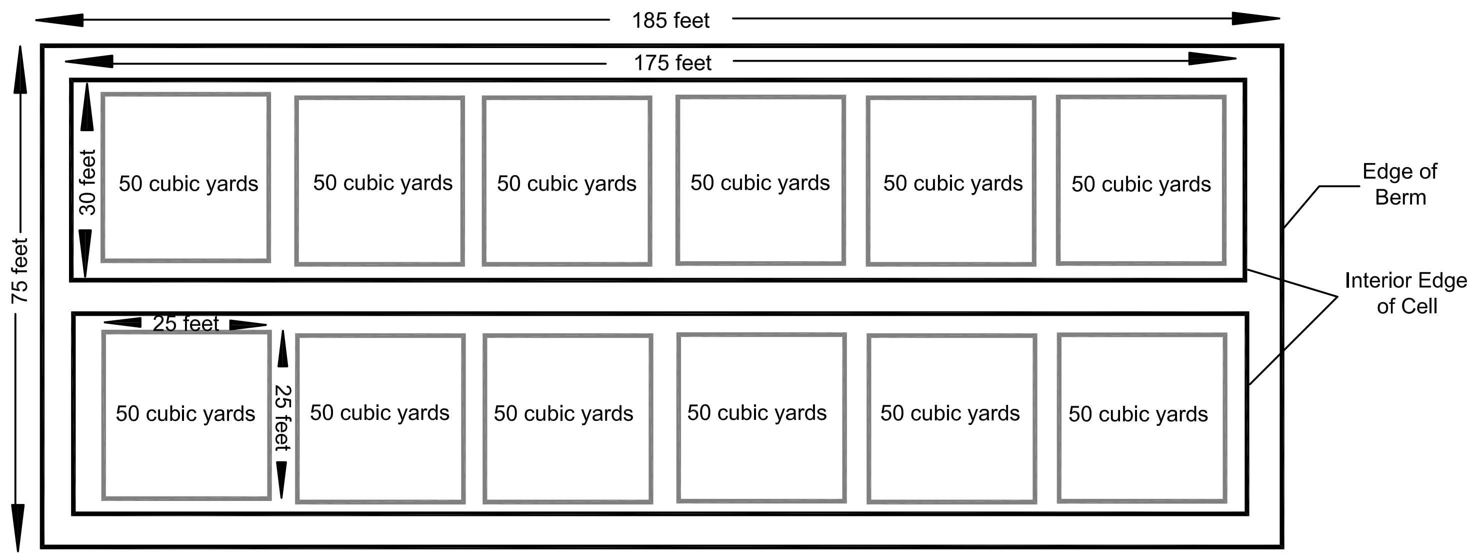
NOTES

1. Visible impact is defined as an observation of projectile slugs, fragments, or pulverized fragments during non-invasive visual assessment of the subject soil (e.g. backhoe bucket).
2. Manual fragment removal may be impracticable due to the presence of fine-grained fragments or lead "dust."
3. 25 ppm standard using the XRF meter applies to both detectable readings, and detection limit for non-detect readings.
4. Soil in these stockpiles will be sampled at a minimum frequency of one screening sample per 10 cy, and one analytical sample per 200 cy of stockpiled soil.
5. Soil in these stockpiles will be sampled at a minimum frequency of one screening sample per 10 cy, and one analytical sample per 50 cy of stockpiled soil.
6. Visibly impacted soil is assumed to require treatment/disposal, and will not be further tested during the characterization effort.
7. Flow chart assumes favorable result from Lead/Antimony correlation study. Unfavorable results will require modification.

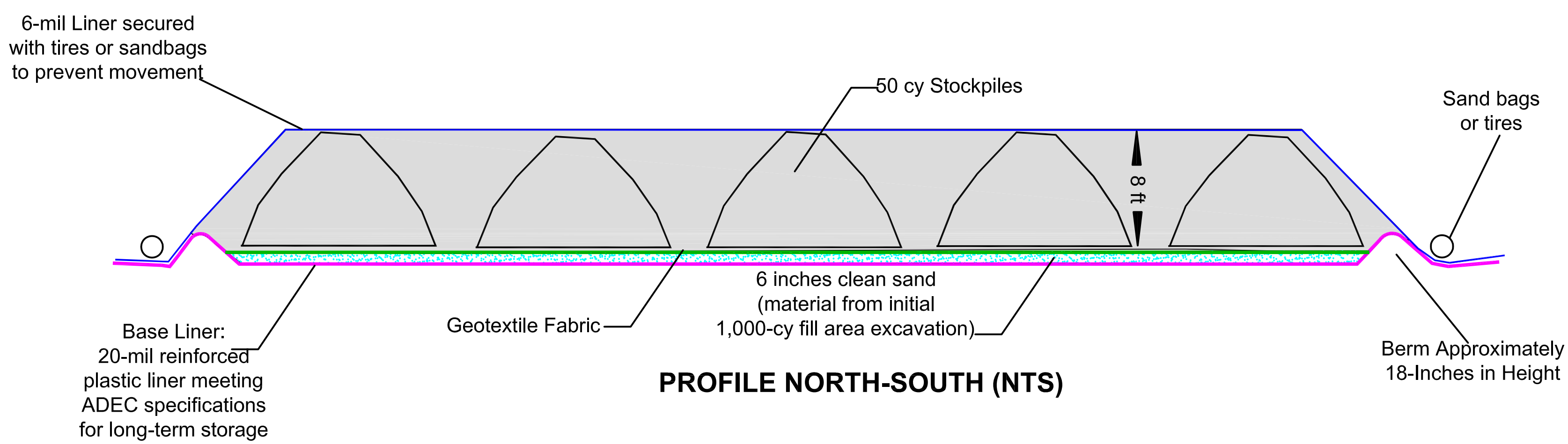


Former Kincaid Park Biathlon Range Anchorage, Alaska	
FIELD SCREENING AND SEGREGATION DECISION MATRIX	
ALTA GEOSCIENCES, Inc. *Environmental & Geotechnical Solutions* **Bothell, Washington**	**Figure 8**

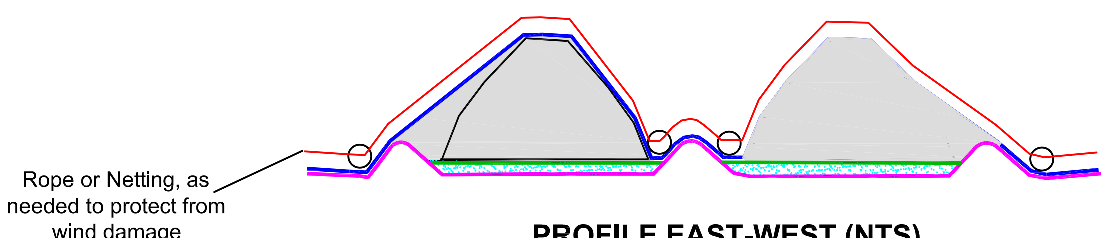

Truck Access
Soil Staging Area
(Base Liner Comprises
Multiple Sections Heat-Sealed
for a Continuous Base)
Temporary Storage (Initial 1,000 cubic yards removed)
Potentially Clean Soil
(XRF >25 ppm, <50 ppm)
Visibly Impacted / Potentially Clean
(XRF <50 ppm)
Potentially Impacted Soil (XRF>50 ppm)
Visibly Impacted Soil and Grubbing
(Separate piles approximately 50 cy each)
Individual cell berms
(min. 18-inch height)
(See Figure 10)
Common cover liners
(See Figure 10)
20 feet
65 feet
Spaced to Allow
Equipment Access
LEGEND
Bermed, lined soil storage cells
(See Figure 10 for Construction Details)
50 cubic yard soil stockpiles
Approximate slope and direction of precipitation
runoff of soil staging area
N
0
40
80
APPROXIMATE SCALE IN FEET
Former Kincaid Biathlon Range
Anchorage, Alaska
SOIL STORAGE AREA
ALTA Geosciences, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington
Prepared For: Kincaid Project Group
Figure
9



PLAN VIEW (NTS)



PROFILE NORTH-SOUTH (NTS)



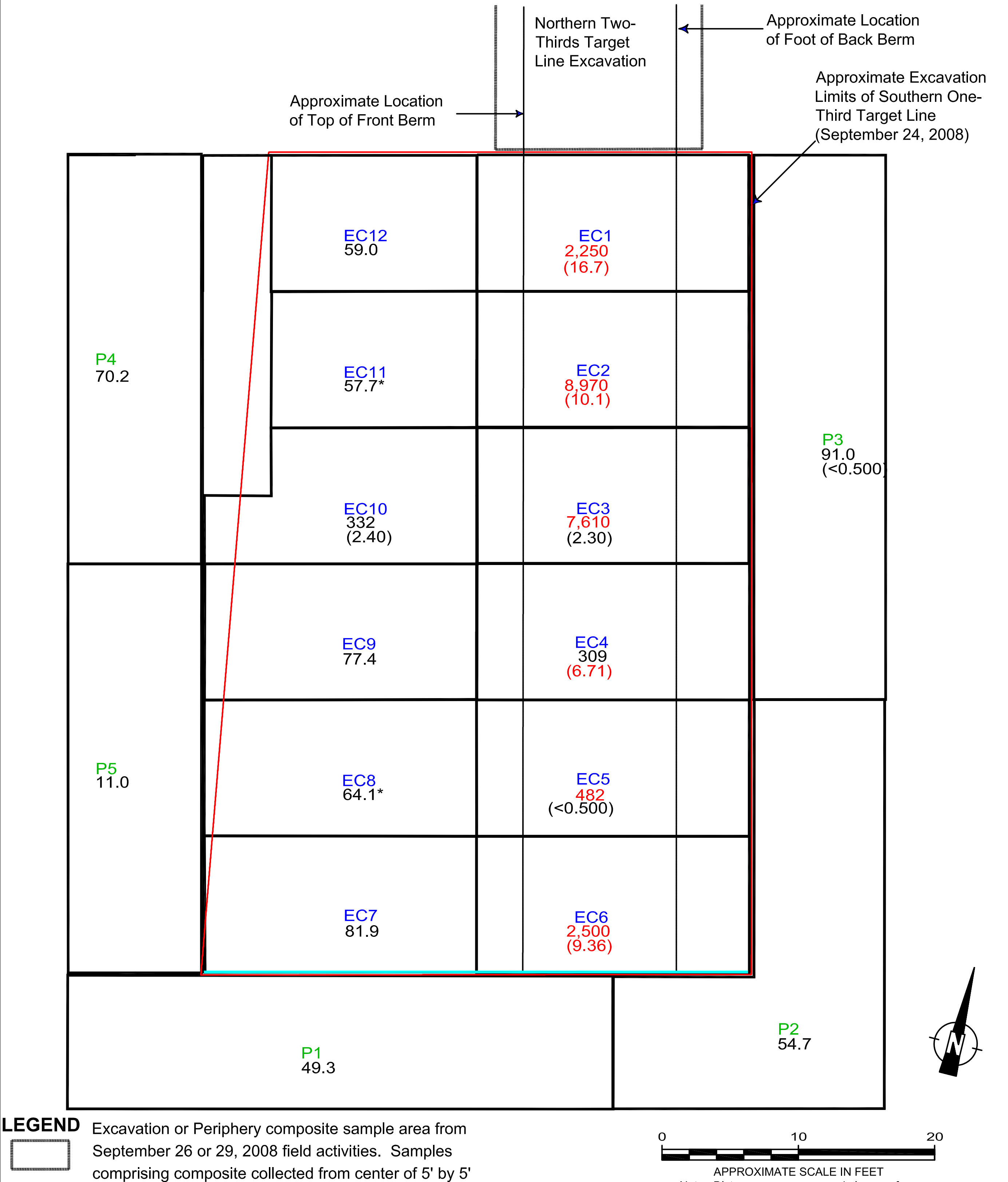
PROFILE EAST-WEST (NTS)

Former Kincaid Park Biathlon range
Anchorage, Alaska

SOIL STOCKPILE CONSTRUCTION PLAN

ALTA GEOSCIENCES, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington
Prepared For: Kincaid Project Group

Figure 10



LEGEND

Excavation or Periphery composite sample area from September 26 or 29, 2008 field activities. Samples comprising composite collected from center of 5' by 5' (excavation) or 5' by 10' (periphery) squares.

2,250
(16.7)

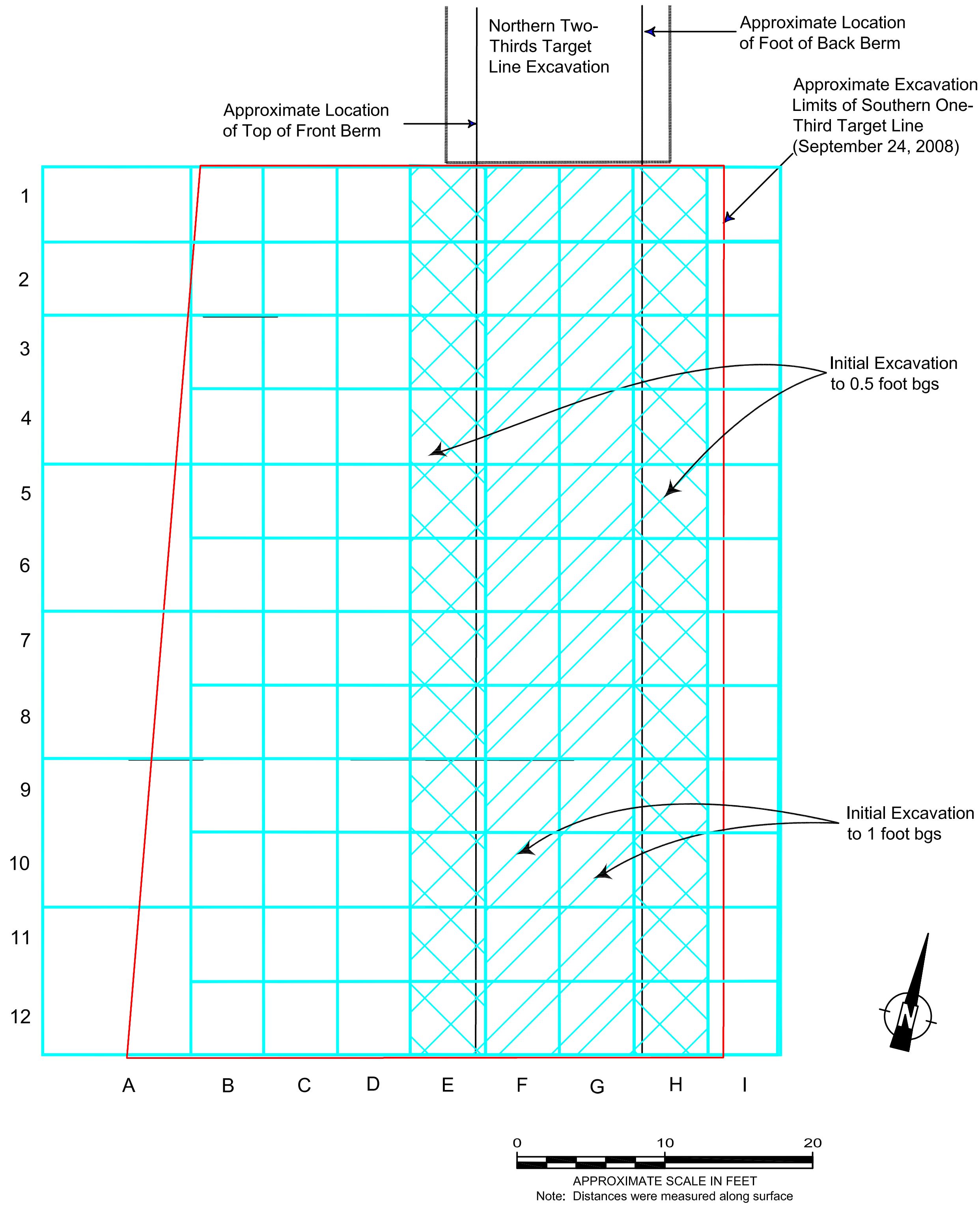
Total lead concentration in milligrams per kilogram (mg/kg); Measured in composite samples collected on September 26 or 29, 2008TCLP lead concentration in mg/kg Values in red are greater than ADECcleanup level (18 AAC 75.341, October 2008) for total lead or greater than RCRA waste characteristic limit for TCLP lead. Asterisk indicates higher result of duplicate pair is listed.

Former Kincaid Park Biathlon range
Anchorage, Alaska

SOUTH TARGET LINE EXCAVATION AREA
2008 SAMPLE LOCATIONS

ALTA GEOSCIENCES, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington
Prepared For: Kincaid Project Group

Figure 11



LEGEND

Approximate Location of Proposed Excavation Grid Squares
cations

Former Kincaid Park Biathlon Range
Anchorage, Alaska

SOUTH TARGET LINE EXCAVATION AREA
PROPOSED 2010 REMOVAL ACTION GRID

ALTA GEOSCIENCES, Inc.
Environmental & Geotechnical Solutions
Bothell, Washington
Prepared For: Kincaid Project Group

Figure 12

APPENDIX A

Consent Agreement and Final Order

RECEIVED

10 OCT -6 PM 2:45

HEARINGS CLERK
EPA--REGION 10

BEFORE THE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:		
	)	
Kincaid Project Group Anchorage, Alaska	))	
	)	
Municipality of Anchorage Anchorage, Alaska	))	Docket No. RCRA-10-2010-0273
	)	
Land Design North Anchorage, Alaska	))	CONSENT AGREEMENT AND FINAL ORDER
	)	
Roger Hickel Contracting, Inc. Anchorage, Alaska	))	
	)))	
Respondents.	)	
	)	

I. AUTHORITY

1.1. This Consent Agreement and Final Order ("CAFO") is issued under the authority vested in the Administrator of the U.S. Environmental Protection Agency ("EPA") by Section 3008 of the Resource Conservation and Recovery Act, ("RCRA"), 42 U.S.C. § 6928. The Administrator has delegated the authority to negotiate and sign Consent Agreements and to issue compliance orders for RCRA violations to the Regional Administrator of EPA Region 10, who in turn has redelegated this authority to the Director of the Office of Compliance and Enforcement ("Complainant") and his representatives. The Administrator has delegated the

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Seattle, Washington 98101
(206) 553-1037

authority to issue the Final Order contained in Part V of this CAFO to the Regional Administrator of EPA Region 10, who in turn has redelegated this authority to the Regional Judicial Officer. Pursuant to Section 3008 of RCRA, 42 U.S.C. § 6928, and in accordance with Section 22.13(b) of the "Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties," 40 C.F.R. Part 22, EPA hereby issues and Kincaid Project Group, the Municipality of Anchorage, Land Design North, and Roger Hickel Contracting, Inc., (Respondents) hereby agree to issuance of the Final Order contained in Part V of this CAFO.

II. PRELIMINARY STATEMENT

2.1. In accordance with 40 C.F.R. § 22.13(b), issuance of this CAFO commences this proceeding, which will conclude when the Final Order contained in Part V of this CAFO becomes effective.

2.2. Part III of this CAFO contains a concise statement of the statutory and factual basis for the alleged violations of RCRA.

2.3. The State of Alaska has not been granted final authorization to administer and enforce a hazardous waste program pursuant to Section 3006(b) of RCRA, 42 U.S.C. § 6926(b).

III. ALLEGATIONS

3.1. At all times pertinent to the violations alleged in this action, Respondents were the owners and/or operators and/or generators at the former Kincaid Park Biathlon range site (Kincaid Park), located in Anchorage, Alaska, where hazardous waste was generated. Kincaid Park is a "facility" as defined in 40 C.F.R. § 260.10.

3.2. Respondents are "persons" as defined in Section 1004(15) of RCRA, 42 U.S.C. § 6903, and are transacting business in the State of Alaska.

3.3. Respondents generated, stored, disposed, or otherwise handled hazardous waste as defined in Sections 1004 of RCRA, 42 U.S.C. 6903(5).

3.4. The violations alleged herein are based on information collected during inspections of the Kincaid Park, facility conducted by EPA on July 16, 2008, and provided in Respondents' April 10, 2009, response to EPA's January 27, 2009, Request for Information issued pursuant to Section 3007 of RCRA, 42 U.S.C. § 6907.

COUNT I. <u>Failure to Determine if a Solid Waste is a Hazardous Waste</u>

3.5. The regulation at 40 C.F.R § 262.11 requires that a person who generates a solid waste must determine if that waste is a hazardous waste.

3.6. On May 8 and 9, 2008, during the closure of a biathlon range at Kincaid Park, Respondents generated waste soil and debris, which is a solid waste within the meaning of RCRA. On July 15, 2008, Respondents identified the waste soil and debris as a D008 hazardous waste. Respondents did not determine if this solid waste was a hazardous waste prior to July 15, 2008.

3.7. Respondents' failure to determine if the waste soil and debris is a hazardous waste is a violation of 40 C.F.R. § 262.11.

COUNT II. <u>Illegal Storage and Disposal of Hazardous Waste</u>

3.8. An owner and/or operator of a facility that stores or disposes of hazardous waste must have a permit or interim status as required by Section 3005 of RCRA, 42 U.S.C. § 6925,

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and 40 C.F.R. § 270.1(c).

3.9. On May 8 and 9, 2008, Respondents generated approximately 35 cubic yards of waste soil and debris by removing it from the northern two-thirds of the target range area of the former biathlon range at Kincaid Park. The waste soil and debris was a D008 hazardous waste due to lead contamination.

3.10. As the waste was generated, it was disposed of in a wastepile a few yards west of the excavation. On May 12, 2008 the wastepile was moved to a location south of the main work area. This second wastepile was placed on a 6 mil plastic liner and partially covered with another plastic liner. Respondents stored this waste at Kincaid Park in the second wastepile until September 24, 2008.

3.11. Between May 21, 2008 and June 6, 2008, Respondents disposed of an unknown quantity of hazardous waste soil and debris by removing it from the target range area and floor of the former biathlon range at Kincaid Park and spreading it throughout the site during cut and fill operations. In addition, any hazardous waste soil and debris remaining in the location of the original wastepile was also removed and disposed of during these cut and fill operations.

3.12. Respondents' storage and disposal of hazardous waste without a permit or interim status is a violation of Section 3005 of RCRA and 40 C.F.R. § 270.1(c).

COUNT III. Failure to Comply with 40 C.F.R. Part 268 Land Disposal Restrictions

3.13. 40 C.F.R. Part 268 sets forth requirements for hazardous waste that is land disposed. These requirements apply to persons who generate or transport hazardous waste, as

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well as owners and operators of hazardous waste treatment, storage, and disposal facilities. These requirements include, but are not limited to the following:

(a) 40 C.F.R. § 268.7(a)(1) requires, among other things, that a generator of hazardous waste must determine if the waste needs to be treated before it can be land disposed.

(b) 40 C.F.R. § 268.9(a) requires, among other things, that the initial generator of a solid waste must determine each EPA Hazardous Waste Number (waste code) applicable to the waste in order to determine the applicable treatment standards under 40 C.F.R. Part 268, Subpart D.

(c) 40 C.F.R. § 268.9(c) requires, among other things, that a prohibited waste which exhibits a characteristic under 40 CFR Part 261, Subpart C may not be land disposed unless the waste complies with the treatment standards under 40 C.F.R. Part 268, Subpart D.

(d) 40 C.F.R. § 268.40(a) requires, among other things, that a prohibited waste identified in the table "Treatment Standards for Hazardous Wastes" may be land disposed only if it meets the requirements found in the table; D008 nonwastewater hazardous waste must be treated to 0.75 mg/L lead by TCLP, and must also meet 40 C.F.R. § 268.48 standards.

(e) 40 C.F.R. § 268.48 requires, among other things, that D008 nonwastewater hazardous waste must be treated to 0.75 mg/L lead by TCLP.

3.14. At the time of generation, May 8 and 9, 2008, Respondents failed to determine if the waste soil and debris needed to be treated prior to land disposal, and failed determine each EPA Hazardous Waste Number (waste code) applicable to the waste in order to determine the

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applicable treatment standards. On May 8, 9, and 12, 2008, Respondents disposed of D008 waste soil and debris without meeting the treatment standard of 0.75 mg/L lead by TCLP.

3.15. Respondents' failure to determine if the D008 waste soil and debris needed to be treated prior to land disposal, to determine each EPA Hazardous Waste Number (waste code) applicable to the waste in order to determine the applicable treatment standards, and to treat the waste to the applicable treatment standards prior to land disposal constitute violations of 40 C.F.R. § 268.7(a)(1), 40 C.F.R. § 268.9(a), 40 C.F.R. § 268.9(c), 40 C.F.R. § 268.40(a) and 40 C.F.R. § 268.48.

COUNT IV. <u>Failure to Obtain an EPA Identification Number</u>

3.16. Under 40 C.F.R. § 262.12 (a), a generator must not treat, store, dispose of, transport, or offer for transportation hazardous waste without having received an EPA identification number from the EPA Administrator.

3.17. On May 8, 2008, Respondents began storing and disposing of D008 hazardous waste at Kincaid Park. On July 24, 2008, the Municipality of Anchorage applied for an EPA identification number for the facility. EPA issued an identification number to the Kincaid Park facility on July 25, 2008.

3.18. Respondents' failure to obtain an EPA identification number prior to the storage and disposal of hazardous waste is a violation of 40 C.F.R. § 262.12 (a).

3.19. When EPA determines that any person has violated or is in violation of Subtitle C of RCRA, EPA may, pursuant to Section 3008(a) of RCRA, 42 U.S.C. § 6928(a), issue an order

U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101
(206) 553-1037

assessing a civil penalty for any past or current violation of Subtitle C of RCRA, and require compliance immediately or within a specified time period.

IV. CONSENT AGREEMENT

4.1. Respondents admit the jurisdictional allegations contained in Part III of this CAFO.

4.2. Respondents neither admit nor deny the specific factual allegations contained in Part III of this CAFO.

4.3. For the purposes of the proceeding, Respondents expressly waive any rights to contest the allegations and to appeal the Final Order contained herein.

4.4. The provisions of the CAFO shall bind Respondents and their agents, servants, employees, successors, and assigns.

4.5. Except as provided in Paragraph 4.11., below, each party shall bear its own costs in bringing or defending this action.

4.6. Pursuant to Section 3008(a)(3) & (g) of RCRA, 42 U.S.C. § 6925(a)(3) & (g), and based on the allegations above, the seriousness of the violations, and any good faith efforts to comply with applicable requirements, Complainant has determined and Respondents agree that an appropriate penalty to settle this action is SIXTY-THREE THOUSAND THREE HUNDRED FOUR DOLLARS ($63,304.00). Each of the four Respondents shall pay FIFTEEN THOUSAND EIGHT HUNDRED TWENTY SIX DOLLARS ($15,826).

4.7. In settlement of the violations alleged in Section III above, Respondents consent to the issuance of the Final Order set forth in Part V below, and each Respondent agrees to pay the civil penalty set forth in Paragraph 4.6 above within 30 days of the effective date of the Final Order, and to undertake the following actions immediately upon issuance of the Final Order:

(a) Within 90 days of the effective date of the Final Order Respondent must submit to EPA a closure plan in accordance with 40 C.F.R. Part 265, Subpart G for the areas subject to closure as a result of the violations alleged in this CAFO. Upon approval by EPA of the closure plan, Respondents shall implement the closure plan as approved. In the event that Respondents or EPA determines that the hazardous waste management area addressed by this closure plan must be closed as a landfill, subject to the requirements of 40 C.F.R. §§ 265.117 through 265.120, then within 60 days of such determination, Respondents must:

i. Submit to EPA a post-closure plan in accordance with 40 C.F.R. § 265.118, and upon approval, the closure plan must be implemented in accordance with its terms;

ii. Comply with the other post-closure requirements for landfills 40 C.F.R. §§ 265.117 through 265.120; and.

iii. Establish and maintain financial assurance for post-closure in accordance with 40 C.F.R. Part 265, Subpart H.

(b) Within 60 days of completion of the closure activities in the areas addressed in the closure plan, Respondents must submit to EPA certification of closure as required by the appropriate state and federal regulations.

(c) EPA and its authorized representatives shall have access to Respondents' facility in accordance with 42 U.S.C. § 6927(a) to monitor Respondents' implementation of and compliance with the terms of this Agreement.

(d) All work to be performed pursuant to the CAFO shall be under the direction and supervision of qualified personnel. Respondents shall provide a copy of the CAFO to all contractors, subcontractors, laboratories, and consultants retained to conduct or monitor any portion of the work performed pursuant to this CAFO. Respondents shall provide a copy of this CAFO to any successor(s) in interest prior to any transfer of owner ship or operation of the Facility.

(f) Attached to this CAFO is a Certificate of Completion which must be executed by Respondents and returned to EPA at the address set forth in Paragraph 4.9 below within fourteen (14) days after full compliance with all of the provisions of Paragraph. 4.7.

4.8. Payment under this CAFO shall be made by cashier's check or certified check, payable to the order of "U.S. Treasury" and shall be delivered to the following address:

U.S. Environmental Protection Agency
Fines and Penalties
Cincinnati Finance Center
P. O. Box 979077
St. Louis, Missouri 63197-9000

Respondents shall note on the check the title and docket number of this case.

4.9. Respondents shall submit a photocopy of the check described above to:

Regional Hearing Clerk
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900 (ORC-158)
Seattle, Washington 98101

Kevin Schanilec
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900 (OCE-127)
Seattle, Washington 98101

4.10. If Respondents fail to pay the penalty assessed by this CAFO in full by its due date, the entire unpaid balance of penalty and accrued interest shall become immediately due and owing. If Respondents fails to pay the penalty assessed, Respondents may be subject to a civil action to collect the assessed penalty, together with interest, fees, costs, and additional penalties described below.

4.11. If Respondents fail to pay any portion of the penalty assessed by this CAFO in full by the due date set forth in Paragraph 4.7, Respondents shall be responsible for payment of the amounts described below:

(a) Interest. Any unpaid portion of the assessed penalty shall bear interest at the rate established by the Secretary of the Treasury pursuant to 31 U.S.C. § 3717(a)(1) from the effective date of the Final Order contained herein, provided, however, that no interest shall be payable on any portion of the assessed penalty that is paid within 30 days of the effective date of the Final Order contained herein.

(b) Handling Charge. Pursuant to 31 U.S.C. § 3717(e)(1), a monthly handling charge of $15 shall be paid if any portion of the assessed penalty is more than 30 days past due.

(c) Nonpayment Penalty. Pursuant to 31 U.S.C. § 3717(e)(2), a nonpayment penalty of 6% per annum shall be paid on any portion of the assessed penalty that is more than 90 days past due, which nonpayment penalty shall be calculated as of the date the underlying penalty first becomes past due.

4.12. The penalty described Paragraph 4.6 above, including any additional costs incurred under Paragraph 4.11 above, represents an administrative civil penalty assessed by EPA and shall not be deductible for purposes of federal taxes.

4.13. This CAFO shall not relieve Respondent of its obligation to comply with all applicable provisions of federal, state or local law, nor shall it be construed to be a ruling on, or determination of any issue related to any federal, state, or local permit.

4.14. By entering into and performing this CAFO, Respondents are not waiving releasing or satisfying, in whole or in part, any claims, defenses, or contribution, indemnity, defense, contract, tort or equitable fault allocation rights or remedies which they may jointly or severally have, or later acquire, against one another or any other person other than Complainant which arise out of, result from, or are based upon any of the alleged occurrences which led to this CAFO.

4.15. The undersigned representatives of Respondents each represent that he or she is duly authorized to enter into the terms and conditions of this CAFO and to bind Respondents to the terms of this CAFO.

4.16. The above provisions are STIPULATED AND AGREED UPON by Respondents and Complainant.

FOR KINCAID PROJECT GROUP

Signature

Dated: 9/30/10

Print Name: DAVID PARISH

Title: BOARD CHAIR

U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101
(206) 553-1037

FOR THE MUNICIPALITY OF ANCHORAGE

______________________________ Dated: 9/30/10

Signature

Print Name: George Vakalis

Title: Municipal Manager

U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101
(206) 553-1037

FOR LAND DESIGN NORTH

[signature]

Signature

Dated: 9/30/2010

Print Name: Wm Dwayne Adams, Jr

Title: President

FOR ROGER HICKEL CONTRACTING, INC.

______________________ Dated: Sept. 30 - 2010

Signature

Print Name: MICHAEL I. SHAW

Title: PRESIDENT

FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10

Edward J. Kowalski, Director
Office of Compliance and Enforcement

Dated: 10/1/2010

U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101
(206) 553-1037

V. FINAL ORDER

5.1. The terms of the foregoing Consent Agreement are hereby ratified and incorporated by reference into this Final Order. Respondents are hereby ordered to comply with the terms of settlement contained in the Consent Agreement.

5.2. This CAFO constitutes a settlement by EPA of all claims pursuant to RCRA for the particular violations alleged in Part III, above. In accordance with 40 C.F.R. § 22.31(a), nothing in this CAFO shall affect the right of EPA or the United States to pursue appropriate injunctive or other equitable relief or criminal sanctions for any violations of law. This CAFO does not waive, extinguish, or otherwise affect Respondents' obligations to comply with all applicable provisions of RCRA and regulations and permits issued thereunder.

5.3. This Final Order shall become effective upon filing.

SO ORDERED this 4th day of October, 2010.

Thomas M. Jahnke
Regional Judicial Officer
U.S. Environmental Protection Agency
Region 10

U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101
(206) 553-1037

BEFORE THE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:

Kincaid Project Group Anchorage, Alaska	)	
Municipality of Anchorage Anchorage, Alaska	)	Docket No. RCRA-10-2010-0273
Land Design North Anchorage, Alaska	)	CERTIFICATION
Roger Hickel Contracting, Inc. Anchorage, Alaska	)	
Respondents.	)	

_______________________________ certifies under penalty of

perjury that the following statement is true, accurate and correct:

Each and every one of the requirements contained Paragraph 4.7 in the Consent Agreement and Final Order issued on _______________________ to the above named Respondents has been fully and timely complied with.

EXECUTED this _______________ day of ____________ 2010

____
(Signature)

____
(Print or type name)

____
(Title)

U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101
(206) 553-1037

CERTIFICATE OF SERVICE

The undersigned certifies that the original of the attached **CONSENT AGREEMENT AND FINAL ORDER** in **In the Matter of Kincaid Project Group., Docket No. RCRA-10-2010-0273,** was filed with the Regional Hearing Clerk on October 6, 2010.

On October 6, 2010, the undersigned certifies that a true and correct copy of the document was placed in the mailbox of:

Robert Hartman, Esq.
U.S. EPA
Region 10, Suite 900
1200 Sixth Avenue, ORC-158
Seattle, Washington 98101

Further, the undersigned certifies that a true and correct copy of the aforementioned document was placed in the United States mail certified/return receipt on October 6, 2010, to:

Peter Van Tuyn
Bessenvey & Van Tuyn, L.L.C.
310 K. Street, Suite 200
Anchorage, Alaska, 99501
Counsel for Kincaid Project Group

Brian Stibitz
Reeves, Amodio LLC
500 L Street, Suite 300
Anchorage, AK 99501
Counsel for the Municipality of Anchorage

Nelson Page
Burr, Pease & Kurtz
810 N. Street, Suite 300
Anchorage, Alaska 99501
Counsel for Land Design, North, Inc.

Terrance A. Turner
Turner & Mede, P.C.
1500 W. 33rd Avenue, Suite 200
Anchorage, Alaska 99503
Counsel for Roger Hickel Contracting, Inc.

DATED this 6th day of October 2010.

Carol D. Kennedy
Signature
Print Name Carol D. Kennedy
Regional Hearing Clerk
EPA Region 10

APPENDIX B

Closure Cost Estimate Calculations & Supporting Data

ALTA GEOSCIENCES, Inc.

FORMER KINCAID BIATHLON RANGE CLOSURE COST ESTIMATE

Table B-1
LABOR AND EQUIPMENT COSTS

		ST	OT	10 HR DAY
L1	Laborer	$65.61	$85.45	$695.80
L2	Laborer Foreman	$67.15	$87.69	$712.58
L3	Operator Foreman	$82.14	$109.41	$875.93
L4	Operator Group I (Operator & Grade Checker)	$77.13	$98.11	$813.23
L5	Operator Group IA	$79.83	$102.14	$842.88
L6	Field Supervisor	$84.46	$112.78	$901.25
L7	Project Manager	$88.69		$709.50
L8	Senior Project Manager	$112.16		$897.30

		HOURLY	DAILY	MONTH	MOBE/DEMOBE R.T.
E1	Excavator, CAT 345C -- 3CY	$126.50	$1,265.00		$1,650.00
E2	Excavator, CAT 320C -- 1.5CY	$66.00	$660.00		$1,496.00
E3	Loader, CAT 950H -- 4 CY	$62.43	$624.25		$1,496.00
E4	Dozer, CAT D4G -- 80HP	$44.55	$445.50		$1,122.00
E5	Compactor, CAT563D-84" Drum	$52.80	$528.00		$1,496.00
E6	Grader, CAT 14H -- 16' Moldboard	$103.37	$1,033.67		$422.40
E7	Water Truck, Peterbilt -- 3600 Gal	$94.33	$943.25		$286.00
E8	Forklift, I-R 843C-8000 # Capacity		$172.00		$1,122.00
E9	Pickup, 3/4 ton 4x4		$84.75		
E10	Flatbed, 1 Ton 4x4		$51.50		
E11	Light Tower -- 6KW		$71.75		
E12	20' Storage Container			$264/MO	$550.00
E13	End Dump Truck	$90.31	$903.10		
E14	Office Trailer			$3,080.00	$550.00

ALTA GEOSCIENCES, Inc.

FORMER KINCAID BIATHLON RANGE CLOSURE COST ESTIMATE

Table B-2
GENERAL COMPONENTS

GENERAL	UNIT COST		3 MONTHS	ASSUMPTIONS & COMMENTS
Office trailer, RHC and Alta	$2,800	Month	$8,400.00	Trailer
Update site security	$10,000	Job	$10,000.00	
Portable Toilets (2)	$400	Month	$1,200.00	Trailer plus Work Zone
Power to Office (Generator)	$3,000	Month	$9,000.00	RHC -- SD
Health and Safety Charges	$1,000	Month	$3,000.00	
Equipment Mobilzation			$10,190.40	
Fuel and Expendable Supplies	$2,500		$7,500.00	
SUBTOTAL OF GENERAL CHARGES			**$49,290.40**	**Assume 3 months duration**

ALTA GEOSCIENCES, Inc.

FORMER KINCAID BIATHLON RANGE CLOSURE COST ESTIMATE

TABLE B-3
EARTHWORK

ACTIVITY	DAY	MONTH	ASSUMPTIONS & COMMENTS
MANUAL SLUG PICKING			
Labor assistance with Slug Picking	$3,005.43	$6,010.85	2 ea. L1, L2, L6, 2 Days
STOCKPILE AREA IN CUT A			
Create stockpile, earthwork crew	$6,855.93	$13,711.85	E2, E3, E7, E13, L2, 2 ea L4, L5, L6, 1/2 ea L7, 2 Days
Create stockpile, laborers, liner, cover, sandbags	$2,104.18	18608.35	2 ea L1, L2, Plus $14,400 materials, 2 Days
Daily stockpile maintenance	$1,408.38	$28,167.50	L1, L2, 20 Days Total (working part of each day x 40 D)
FOCUSED SOIL REMOVAL			
Excavate selected areas as directed by Engineer	$6,855.93	$13,711.85	E2, E3, E7, E13, L2, 2 ea L4, L5, L6, 1/2 ea L7, 2 Days
AREA A1 SOIL REMOVAL			
Excavate 1000 CY, allow screening, remove to SP	$6,855.93	$13,711.85	E2, E3, E7, E13, L2, 2 ea L4, L5, L6, 1/2 ea L7, 2 Days
Excavate 11700CY, screening, dispose as directed	$6,855.93	$157,686.28	E2, E3, E7, E13, L2, 2 ea L4, L5, L6, 1/2 ea L7, 23 Days
AREA A2 AND A3 SOILS REMOVAL			
Excavate 1250 CY, allow scrn, remove to SP	$6,855.93	$20,567.78	E2, E3, E7, E13, L2, 2 ea L4, L5, L6, 1/2 ea L7, 3 Days
SOUTH TARGET LINE BENCH			
Excavate top 20 CY, stockpile for Haz Waste Disposal	$6,855.93	$6,855.93	E2, E3, E7, E13, L2, 2 ea L4, L5, L6, 1/2 ea L7, 1 Days
Excavate Remaining designated remvoval area, 280 CY			
BACKFILL INITIAL 1000 CY IN EXCAVATION			
Remove from SP and backfill initial 1000 CY	$6,855.93	$6,855.93	E2, E3, E7, E13, L2, 2 ea L4, L5, L6, 1/2 ea L7, 1 Days
MOVE CLEAN SOIL FROM STOCKPILE			
Move and backfill stockpiled soil meeting cleanup	$6,855.93	$6,855.93	E2, E3, E7, E13, L2, 2 ea L4, L5, L6, 1/2 ea L7, 1 Days
EARTHWORK SUBTOTAL		**$292,744.08**	

Alta Geosciences, Inc.

FORMER KINCAID BIATHLON RANGE CLOSURE COST ESTIMATE

TABLE B-4
TREATMENT AND DISPOSAL

	UNIT COST	NUMBER UNITS	SUBTOTAL COST	ASSUMPTIONS & COMMENTS
	Units are for Tons			
SUBTITLE C FACILITY TREATMENT AND DISPOSAL				
Ship, landfill treatment, disposal	$375	160	$60,000	Assume 20 tons from firing line, 100 tons fail TCLP post onsite treatment and 40 tons from spot cleanup
ONSITE TREATMENT PLUS SUBTITLE D LANDFILL DISPOSAL				
	Units are for Tons			
Mobilize and setup chemical treatment equipment	$30,000	1	$30,000	
Handle and treat 1600 TN soil	$75	800	$60,000	
Transportation to Muni LF, Eagle River area	$21	800	$16,800	Assume 2 hr RT haul from site to Eagle River, 10 CY Trk
Landfill Tipping Fee	$53	800	$42,400	Based on most recent quotation
TREATMENT AND DISPOSAL SUBTOTAL			**$209,200**	

TOTALS

GENERAL	**$49,290**
EARTHWORK	**$292,744**
TREATMENT & DISPOSAL	**$209,200**

TOTAL ESTIMATED COST: $551,234